

EDUCATIONAL INNOVATION Report 2019 2020

Tecnológico de Monterrey

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WELCOME



This year, an unprecedented global crisis led to the emergence of important initiatives in various fields, including education. The challenge of maintaining academic continuity in the face of an enduring crisis due to COVID-19 has forced educational institutions at all levels to reinvent themselves to adapt to the new reality. In this context, Tecnológico de Monterrey has once again demonstrated its commitment to innovation and its ability to meet major challenges.

The enthusiasm and commitment from our teachers, together with the coordinated work of our Schools and support areas, have enabled more than 9,000 teachers from over 25,000 groups, in a single week, to migrate from a face-to-face model to a completely digital and remote model. Resuming activities to maintain the academic continuity of the February-June 2020 period was the first major challenge. To achieve this goal, it was necessary to define a teaching model for this new context, to train teachers and to migrate more than 55,000 face-to-face classroom sessions per week to a remote yet synchronous format.

The context has not yet enabled us to return to normality, but the institution has maintained its commitment to the quality of education, and new resources and strategies have been developed to offer better experiences to our students. Not only have teachers fully adopted distance modalities: they have also participated in initiatives to innovate and improve their current courses for the new teaching model required.

For this reason, the **third edition of the Educational Innovation Repor**t focuses on focuses on the recognition of the process of transformation of our teachers, courses and students to adapt to a digital model and to maintain academic continuity, as a great innovation of the year.

The first section of the report focuses on presenting each of the actions that have led us to a process towards the digital world to cope with the health contingency; then, some of the most important actions that the Schools have had to implement in this process of transformation toward the digital world are presented. Also presented are the educational innovation initiatives that were used during the year, even before the contingency. We close the report by sharing some of our academic community's awards and honors on educational innovation issues.

This year, we have not only learned what we are capable of, but also that our future will not be the same. We need to use all the experiences of this phase to emerge even stronger. Digital education must be an important part of our educational model, which complements in-person education to increase flexibility initiatives and challenging experiences for our students.

Elsa Beatriz Palacios
Educational Innovation Director
Vice-rectory for Academic Affairs and Innovational Education
Tecnológico de Monterrey





Transformation toward a digital model to face the health contingency: the great innovation of the year

Tecnológico de Monterrey's digital education experience

The use of technology to move education beyond a physical space and its limits represented a great bet for Tecnológico de Monterrey, which in 1989 seemed bold and with an uncertain future. However, today we see that every step taken in over 30 years of history in distance education enabled the institution to gain sufficient experience to be prepared at an historical moment, where technology-based education has been an indispensable factor in addressing the health contingency we have had to experience all throughout 2020.

Tecnológico de Monterrey's history in distance education began in 1966, when it held the first class on television; later, in 1987, the campuses of Monterrey and Estado de Mexico joined the BITNET network to provide e-mail and file sending services. A satellite network for the transmission of voice and data among all campuses was also installed.





The 26 campuses communicated via computer through the ITESM system's satellite network.

In 1989, the experience of using satellite technology for communications was channeled and applied to meet the need for teacher training. In that year, the Interactive Satellite Education System was launched to connect all of Tecnológico de Monterrey's campuses, with courses broadcast from Monterrey and Estado de Mexico. This institutional project enabled the integration of distance education throughout the institution.

In the early years of this first stage, the educational offer of distance education gave priority to graduate degrees, offering at this level the first courses and complete programs. In June 1989, the first Programming Systems course for the Master's Degree in Computer Sciences was offered and, in August of the same year, the Master's Degree in Education with Specialties in priority areas for teacher training began. Two common courses were offered for all professional careers in January 1990: Values for professional practice and Sociocultural values of the world.



Tecnológico de Monterrey's first satellite transmission.
April 29, 1989.





Virtual University Activities.

Due to the increase in the numbers of programs, students and external venues receiving distance education, in 1996 Tecnológico de Monterrey created its Virtual University (UV), with the aim of promoting and developing distance education. In this second stage, its offer increased and diversified, and new technologies and pedagogical models were also integrated. E-learning was consolidated, geographic coverage was extended and the number of users of the modality significantly increased, reaching more than 45,000 undergraduate students and over 100,000 participants in social and executive education programs.

In 2013, the third stage of distance education began, characterized by a decentralized and process-based operational model, and was established as a national and institutional academic strategy, with steady growth and innovative development, as well as a global reach.

During all these years, the strengthening of the digital and distance model has enabled Tecnológico de Monterrey to serve more than 135,000 undergraduate students, over 34,000 graduate students, and over 3 million participants in continuous education courses.

Historical reach of distance education at Tecnológico de Monterrey

1st stage	2nd stage	3rd stage
1987 - 1995	1996 - 2012	2013 to date
+19,500 undergraduate and graduate students..	+ 45,000 undergraduate students per year.	+ 135,000 undergraduate students.
+ 300 teachers.	+ 100,000 participants in social programs and executive education each year.	+ 34,000 graduate students.
+ 20,000 participants in conferences and continuous education programs.		+ 3 millones participants in continuous education.

Department of Educational Innovation. 2020.

The year 2020 has not only represented for Tecnológico de Monterrey the beginning of a step towards maintaining the implementation of new technologies and methodologies for the institution's digital education. This year was also an opportunity to test many of the experiences and lessons learned. Because of the health contingency derived from the COVID-19 pandemic, the practices and experiences of digital and distance education enabled the institution to maintain academic continuity and make a historic leap towards a completely distance education offering at all levels, for nearly 100,000 students.

The transformation capacity of teachers and students test the Institution's commitment to innovation, but, above all, it has forced us to keep an eye on a future where we cannot return to old patterns, but rather emerge stronger to be more effective in the application of digital education.

Next, we present some of the actions undertaken for the transformation to a digital model to ensure academic continuity during the health contingency. Together, they represent Tecnológico de Monterrey's great innovation of the year.

Institutional actions for academic continuity during the health contingency

"It has been nine very complex months, but we are filled with hope and gratitude for being part of an institution that allows us to grow, learn, contribute and enrich the development of our students' lives."



Juan Pablo Murra Lascurain.
Rector of the Undergraduate and Graduate Programs.

In March 2020, the COVID-19 contingency disrupted all aspects of our lives, including the education field. Tecnológico de Monterrey suspended face-to-face classes on March 17 on its 26 campuses, as a measure to prevent the spread of the virus, and announced academic continuity from March 23 under a fully digital model.

A week before suspending in-person activities, different teams of the institution began to design a contingency plan, and defined a strategy to ensure the change to a digital format with the necessary conditions for immediate and effective progress. This first part of the strategy has been integrated into the Flexible and Digital Model (FDM). The premises identified for the implementation of the strategy were as follows:

1	All courses at all levels must be taught in a digital model. There will be no academic activity in person.
2	The hours, duration and frequency of classroom sessions are to be maintained, but now, using the videoconferencing format and following the duration criteria defined in the academic guidelines.
3	The proven technologies already used in the institution (Canvas, Zoom) must be used to resume the courses quickly and efficiently.
4	Teachers must receive the necessary training and resources to be able to implement the new model.

Within the framework of these guidelines, a teacher preparation and delivery plan was developed. The challenge was to simultaneous training of nearly 10,000 teachers of different educational levels, who had to work on the digital transformation of their courses to meet the needs of more than 90,000 students and 25,000 groups awaiting the reactivation of classes. Over 55,000 synchronous sessions required preparation to be taught in the new model, for which it was necessary to enable the technology and the creation of model for monitoring and attending teachers, students and groups, with the participation of over 1,500 collaborators.

Since the beginning of classes in the FDM model and as the situation stabilized, new strategies were designed to ensure not only stability, but also an improvement in the students' experience in the new modality. Some of the actions implemented were:

- The FDM Plus model was **designed and implemented** , enriched with additional value elements to support our students and their families: Take Care of your Mind, Boost your Skills, LiFE@Home and Tec Value Benefits.

- The HyFlex + Tec model was designed and implemented to begin the August semester with new components that would enable the flexible return to face-to-face sessions.

- **630 classrooms across the country were equipped** , with technology and furniture to deliver synchronous teaching to half of the students in the classroom, while the other half works remotely.

- **Primary Care Modules** were established on all campuses that enabled increased attention to students and collaborators in medical situations related to COVID-19.

- A new **Technology Ecosystem** was developed for the monitoring and tracking of cases in the Tec community, which included an app for the daily monitoring of symptom, a QR code for capacity monitoring, a proximity board and a medical monitoring platform, through teleconsultations.

- A **Central Laboratory** for weekly national wastewater monitoring was installed to detect and respond in a timely manner to the possibility of a COVID-19 outbreak in any of the facilities.

- **The campus facilities and services were reconfigured** according to health protocols with signs and sanitary products for priority areas.

- A **Student Contingency Fund** was created to support Tec families who have faced financial problems rising from the crisis. Through this program, thousands of students have benefited from discounts, debt extensions and relief, or scholarships, depending on each situation.

Among the various actions undertaken in this strategy to address the health contingency, there is no doubt that the preparation of teachers in a short period of time was the greatest challenge. At the same time it was one of the most strategic actions to ensure academic continuity and the successful completion of the semester interrupted by the contingency.

Teacher training and assistance strategy

"Teachers have been the equivalent of doctors in hospitals, that is, heroes who teach and solve all kinds of problems, reminding us that teaching is a call."

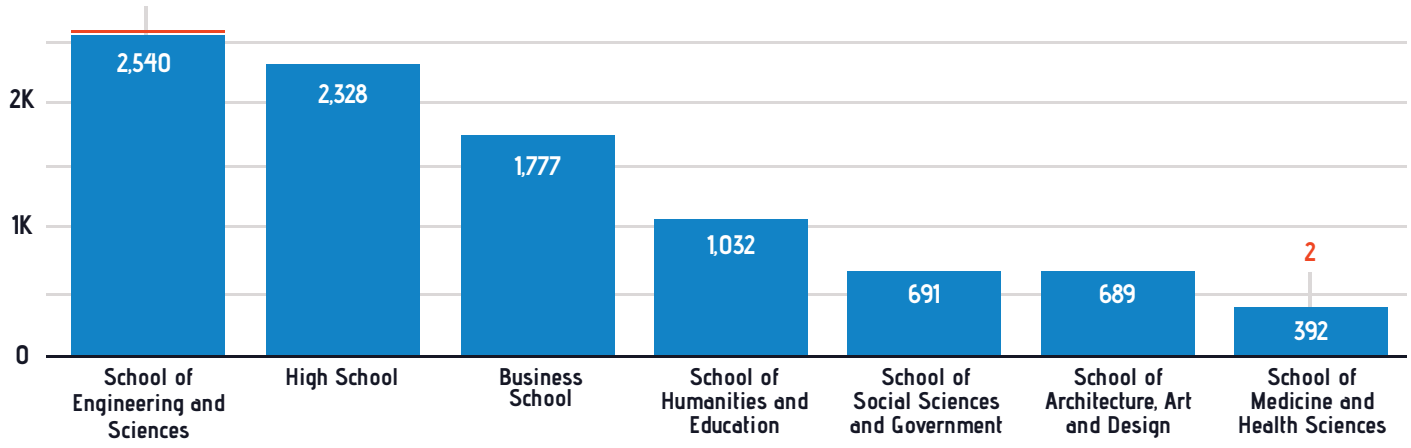


Joaquín Alejandro Guerra Achem.
Vice-Rector for Academic Affairs and Innovational Education.

The week prior to resuming classes, the basic training offer was launched for nearly 10,000 teachers on the Flexible and Digital Model through the national team of Centers for Teacher Development and Educational Innovation (CEDDIE, in Spanish), and with the collaboration of specialists from areas such as Educational Innovation, Technologies for Education and other expert teachers.

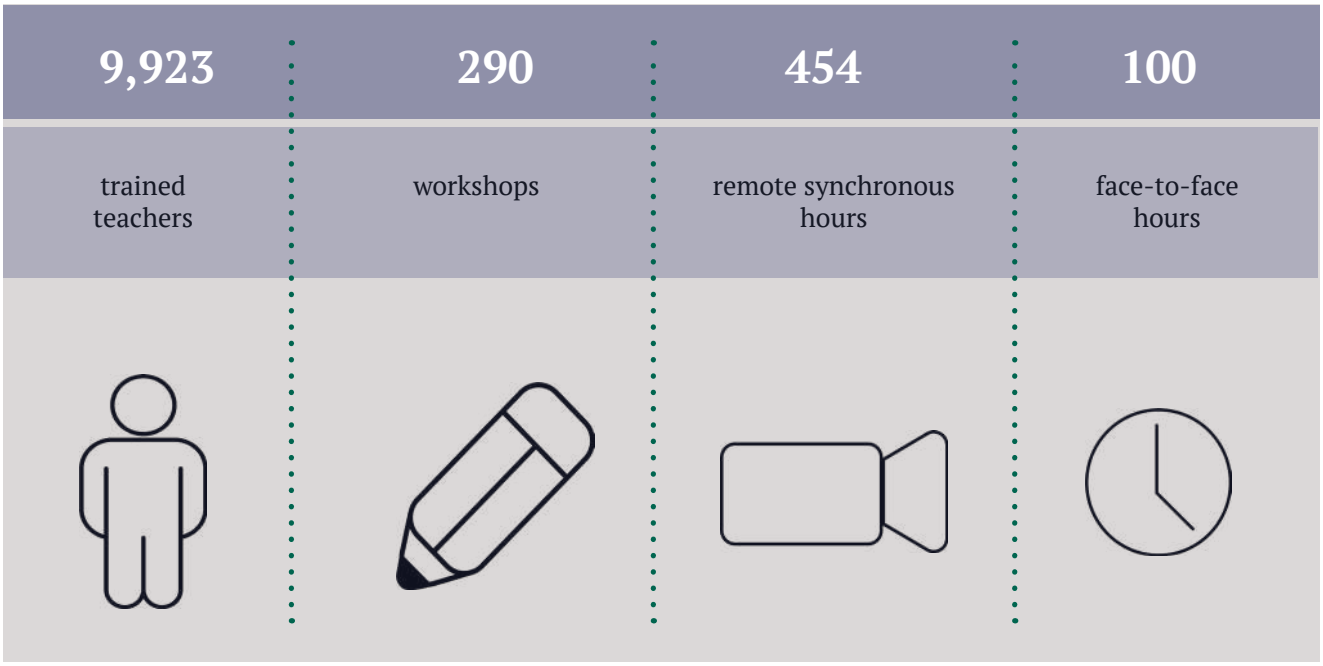
The challenge was not small. For 10 days teachers were trained with the initial course "Transform your course to the Digital Context." From 13 to 22 March, 277 workshop sessions were held, and 227 were carried out via Zoom, for teachers of High School, Undergraduate and Graduate levels of all the Schools and campuses.





Tracking of teachers per School in the program of academic continuity. CEDDIE. 2020.

Also, one week prior to the launch of the Flexible and Digital Model (FDM), 290 workshops were held, focusing on the use of proven technologies already implemented at the institution. Nearly 70,000 hours were invested in teacher preparation for the transformation of courses to the digital context and the design of active learning activities. Additionally, more than 1,700 employees also participated, providing pedagogical and technical support.



Teacher training, prior to the launch of the Flexible and Digital Model. CEDDIE. 2020.

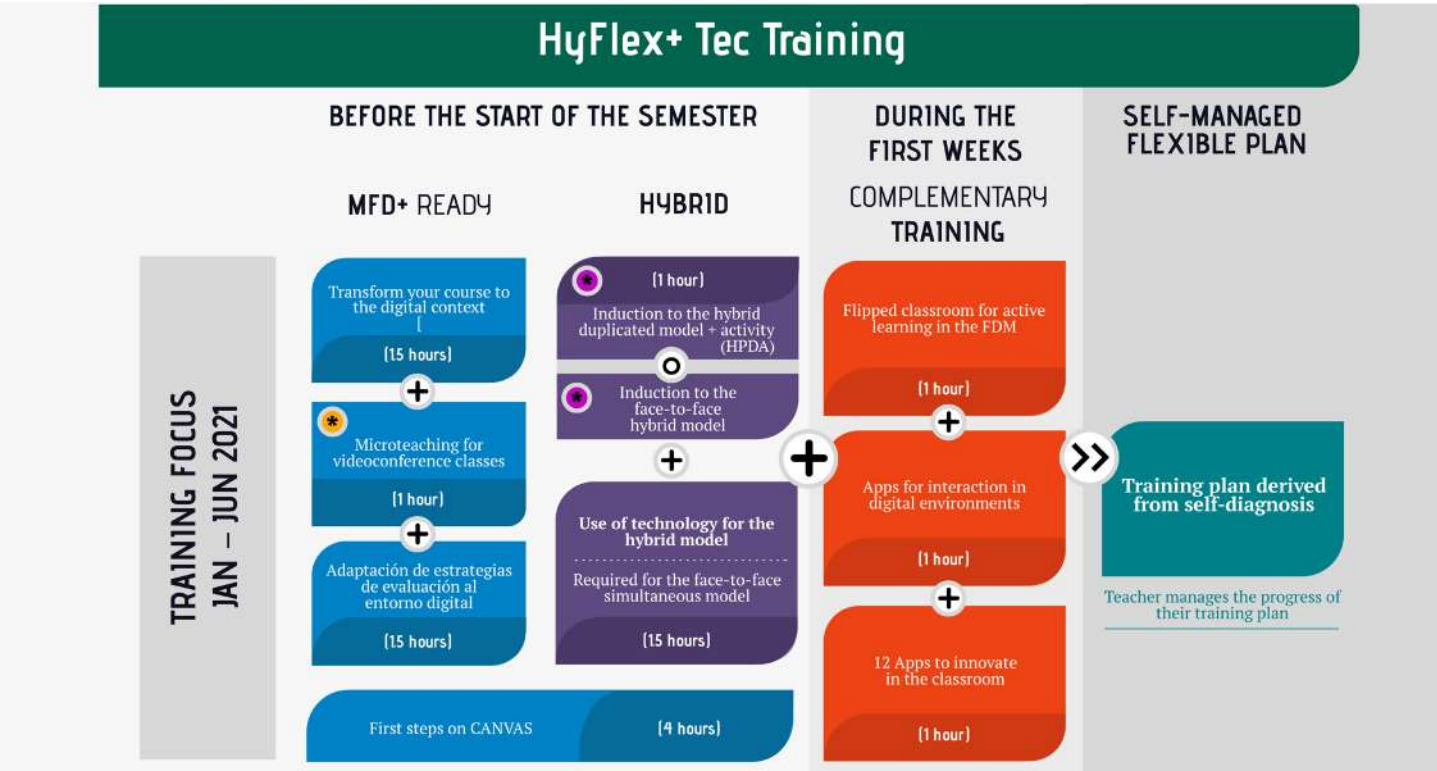
We closed down the classroom and turned Zoom on.

After the first week of intensive training, starting on March 23 teachers kept training using nation-wide digital courses on interaction in virtual environments, assessment tools in virtual environments, Google apps for collaborative work, creation of audiovisual content, apps for learning in virtual environments and advanced Zoom training to take advantage of the tool that became, from that moment on, the virtual classroom for our students and teachers.

To continue with the improvement in the design of academic experiences during the health contingency, a self-diagnostic tool was applied starting on April 1 in order to measure teachers' digital skills and to identify their strengths and areas of opportunity to teach in the Flexible and Digital Model. Based on the results obtained, new course were offered through Success Factors and the CEDDIE portal, in order to meet the specific training needs detected, offering personalized training paths.

Other actions carried out to reinforce the preparation of teachers for academic continuity were:

- Continuous, **pedagogical and technology support** was offered.
- Teachers with knowledge or experience in digital formats were identified and invited to **share their experiences.**
- Technologies already tested in the institution were enabled and some special tools were added, which focused on meeting the specific needs of a certain set of subjects.



Teacher training process during the health contingency period. CEDDIE. 2020.

One month into the academic continuity, these training strategies enabled 180,000 class sessions to be held with 99 % of the groups with no incidents.

Teaching support strategy.

In addition to formal training and as part of the support offered to teachers during the delivery of their courses, several channels were opened to offer pedagogical and technological advice with specialists from the Centers for Teacher Development and Educational Innovation (CEDDIE), the Department of Educational Innovation and the Department of Technologies for Education.

The support activities included an extended group of 1,715 people from different departments of the key areas of the institution, in order to achieve, in two weeks, the launch of the Flexible and Digital Model and the implementation of:

- Academic buddies (collaborators and teachers).
- Support desks.
- Support coordinators.
- Trainers and instructional advisers
- Developers of the Buddies systems and indicator dashboards.
- Content developers and web programmers.
- Support to administrators, faculty, students, and people responsible for the dissemination, communication, and creation of reports and indicators and technological updates.

Some of the actions implemented with the most impact on the support process with teachers, at the beginning and for the development of sessions via Zoom, are described next.



Remote Academic Buddy

Remote academic buddies accompany teachers, during the academic continuity, from the start of their class to provide help with any technical and academic setbacks that may arise during the session.
They are responsible for detecting general incidents with the tool and ensuring the proper functioning of the session; they also are the primary source of information for assistance reports.

Teaching advisor

The role of the teaching advisor was offered for massive courses of 90 to 150 students, so that sessions could run smoothly.

The support of the advisor made it possible to ensure the correct logistical and pedagogical development of the class in the digital model, thus ensuring an appropriate experience for students.



Another teaching assistance strategy was the continuous monitoring through the Buddy Assistance Coordination Desk, created to accompany and support the remote academic Buddy functions, so that during their intervention in the Zoom sessions, they had the necessary information for the solution of possible technical problems during classes, ensuring an appropriate experience of both students and teachers.

Troubleshooting and monitoring tasks were carried out from 8:00 a.m. to 10:00 p.m., covering all class hours throughout the day.

During the February-June 2020 period, the support groups invested 82,483 hours preparing and monitoring the implementation of the Flexible and Digital Model.

Flexible and Digital Model implementation Stats
February - December 2020

429,299 sessions* during the February – June period

26,987 sessions* during the summer.

880,832 sessions* during the August – December period

+1.3 million sessions in total.

Up to **1,400** simultaneous sessions.

96.2% sessions on average without incidents affecting students.

*Includes Undergraduate, Graduate, High School, LIFE and social service.

CEDDIE introduced in the summer its training model focused on the HyFlex + Tec model in response to the challenges posed by the possibility of returning to classes on some of the campuses and to accommodate our teachers. The model included as a new element the training for hybrid courses in their two modalities: Simultaneous Remote Face-to-face Hybrid Model and Duplicate Face-to-face Hybrid Model + Activity, establishing them as the next steps to follow, once the conditions for returning to the classroom are met.



Models for the digital transformation

"The year 2020 brought a great opportunity to accelerate the digital transformation of education, and at Tec we have benefited from it thanks to over 30 years of experience in digital education. The training process has been greatly enriched, which will be ongoing."



Román Martínez Martínez.
Vice-Rector of Educational Transformation.

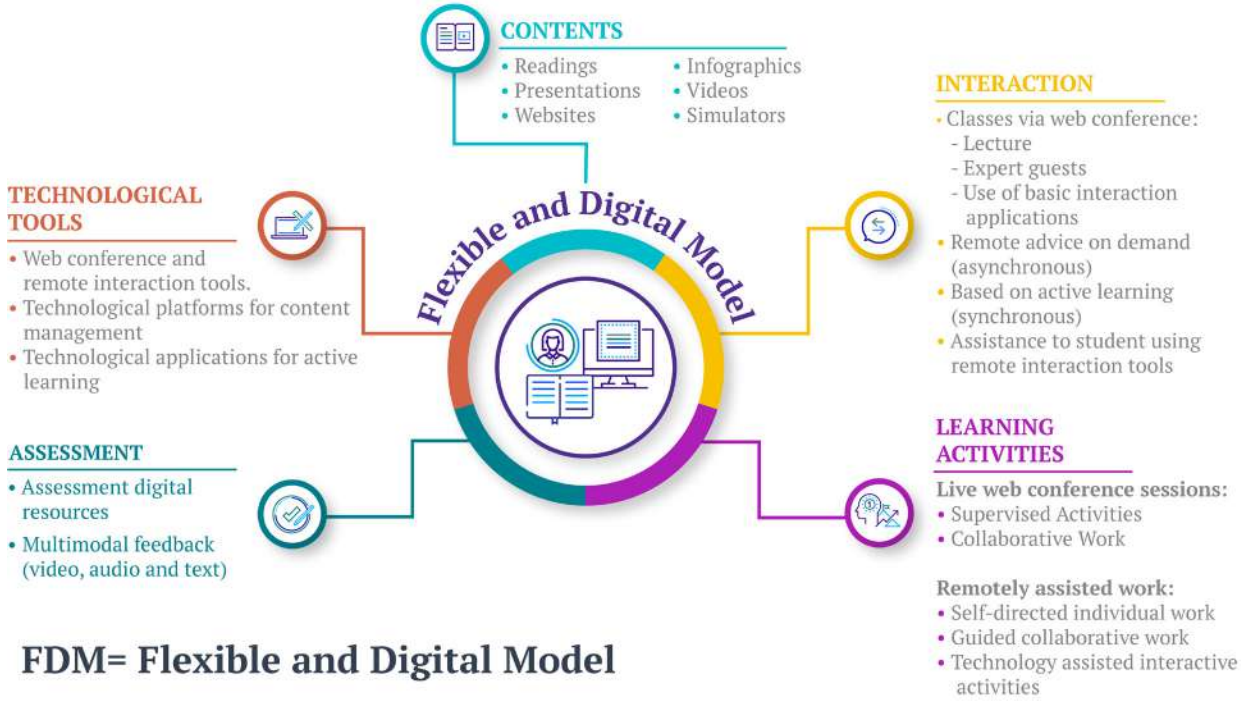
The contingency due to COVID-19 generated the deployment of the digital world in the educational experiences of our students. This meant adopting new technologies, as well as reinforcing the pedagogical aspects of our distance education model and, above all, promoting multimodal education to learn from any place and at any time.

The transformation towards a digital model to address the health contingency became the great innovation of the year: it involved the design of a model to resume classes and it has been an opportunity to continue adding new actions that have improved academic performance in a digital modality. These actions are integrated into the three models currently implemented: Flexible and Digital Model, Flexible and Digital Model Plus and HyFlex+ Tec.

Flexible and Digital Model - FDM.

To implement the Flexible and Digital Model (FDM), in addition to its conceptualization, guidelines and suggested methodologies were defined so that teachers could adapt the organization of their courses and consider the main aspects of the model for their delivery through a distance format, thus facilitating the academic continuity.

The design of the learning experiences integrated various didactic components that enabled, on one hand, the flexibility to ensure that the teaching-learning process could be adjusted to the different needs and situations of the students, regardless of issues of time or space; and, on the other hand, to take advantage of educational technology to create hybrid or distance learning experiences.



Ideal conceptualization of the transformation of a face-to-face course to a digital model. Department of Educational Innovation, 2020.

The key goals of the Flexible and Digital Model were:

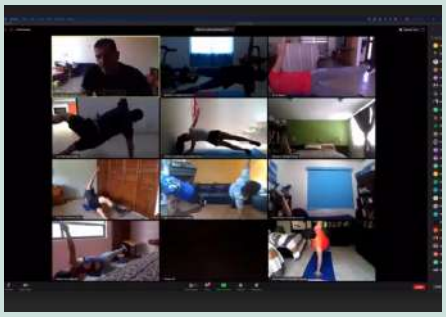
- The ease of continuing teaching classes without making radical changes in its contents and structure; the basis of the model focuses on replacing face-to-face classes with remote ones.
- The flexibility to conduct the course sessions live (via web conference), from any place. Students and teachers could be physically anywhere with internet access (home, another campus, within or outside the country, etc.)
- The use of remote interaction tools for the teacher to provide assistance, support, advice and feedback.
- The availability of support resources to learn the contents (videos, web pages, explanations, etc.)
- The development of active learning through web conference sessions, as well as through remote-assisted work.
- The use of appropriate educational technology to generate hybrid or distance learning experiences.

Flexible Digital Model Plus- FDM Plus.

By April 2020, the future remained uncertain, given the scope of the health contingency and the Social Distancing National Campaign. As a result, the decision was made to complete the semester and carry out the summer programs using the digital model. However, it was important to improve the strategy initially implemented, incorporating elements to enrich the FDM and ensure significant learning and training experiences; therefore, the Flexible Digital Model Plus (FDM Plus) was introduced. The improved model maintains the FDM's basic pedagogical and operational aspects, but with new elements to enrich the experience. FDM Plus integrates six training pillars ranging from resources for distance education to promoting social actions.

Training pillars of the FDM Plus







Academic continuity 2.0

An improvement of the distance training model characterized by tools and technologies that enhance academic development, including virtual laboratories, an online digital library and librarian support; continuous training for teachers and a support and advisory website where students can inquire about the existing services and resources for their distance learning and experience.

Life@home

This program offers more than 1,200 daily online activities and classes that promote wellness; some of them include sporting events and eSports competitions, as well as free courses in health, music, art, leadership, psychology and well-being.

Take care of your mind

The program offers information and resources to promote emotional health. Through a 24-hour hotline, it provides free psychological, medical and nutritional counseling, as well as personalized accompaniment from mentors, advisers and career directors, and support material.

Boost your skills

Through alliances with Coursera and EdX, courses, specialized programs (MOOCs) and certificates are offered, helping students to complement their learning, develop skills and obtain certifications.

Tec Value Benefits

Preferential prices, benefits, packages and discount programs to support the financial situation of students. In addition, it offers a platform for sharing and publishing family business products and services from the Tec community.

Tec community linking

This program has undertaken over 220 actions by members of the Tec community to address the challenges the health contingency poses. The purpose of this space is to share, connect and promote these projects, as well as to put high value resources at the service of the community in general.

HyFlex+Tec Model.

For the August-December 2020 semester, a return to the classroom that could combine face-to-face and digital modalities was envisioned. This gave rise to the HyFlex+ Tec Model, conceived to enable a hybrid and flexible educational experience that could make it possible to adapt to variable scenarios at different times of the semester, according to the COVID-19 Traffic Light Monitoring System of each city, each campus and even, according to the specific needs of students and teachers, prioritizing the health and safety of all, and ensuring quality and academic continuity.

The HyFlex+Tec model is...

Hybrid	Flexible	Plus
Because it combines distance and face-to-face activities.	Because it moves easily between hybrid and distance formats.	Because it integrates hundreds of available activities and resources for personal development and well-being.

This model is characterized by the combination of distance (in FDM), hybrid and face-to-face courses within the semester's academic load of the student, who experiences different degrees of face-to-face sessions at different moments in the semester. Its main objective is to enable students to continue with their academic training with high quality standards, according to current demands, within a safe environment and enjoying the Tec experience.

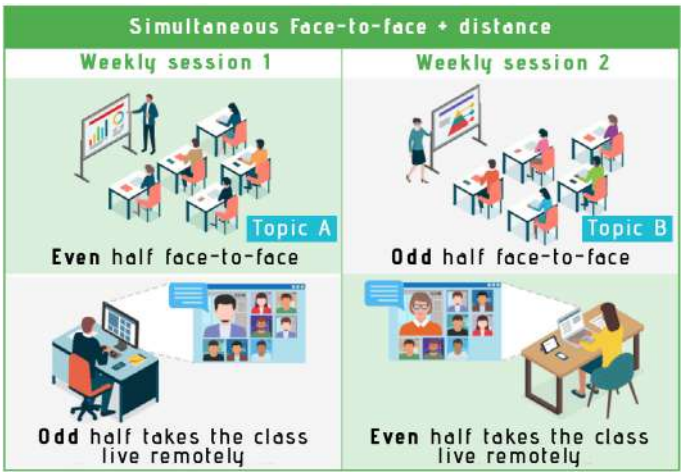
On Monday, August 10, 2020, about 90,000 High School, Undergraduate and Graduate students returned to classes using the HyFlex+ Tec model, in which they could decide between classes 100% remote (in FDM) or in a hybrid format.

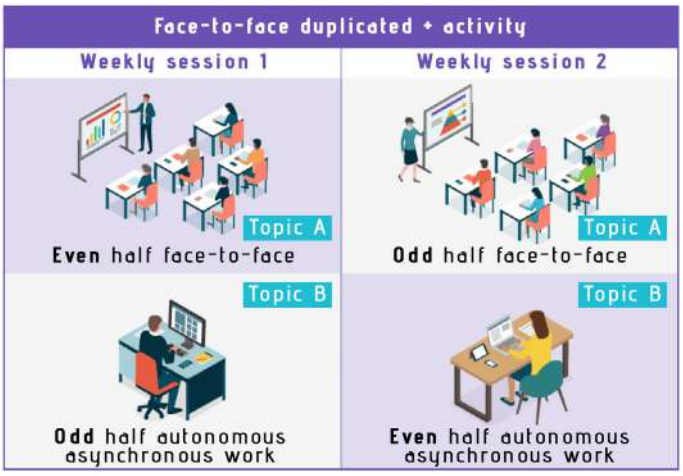
The Simultaneous Remote Face-to-face Hybrid and Duplicate Face-to-face Hybrid + Activity modalities were designed for the hybrid format.



The **Simultaneous Remote Face-to-face Hybrid Model** involves simultaneous work in real time between two groups of students. It is designed so that the first group attends the classroom in person, while the second group takes the class remotely, using videoconferencing tools. For this modality, some technologies were integrated to facilitate the classroom experience, both for students and teachers.

The **Duplicate Face-to-face Hybrid Model + Activity** involves alternating the work of the students, divided into two groups: even and odd, according to their student registration number. In this model, one half of the group attends face-to-face activities while the other half performs remote activities asynchronously; the two groups would alternate subsequently throughout the school term.





Implementation of hybrid models. 2020.

Although at the time of completing this report it had not been possible to implement hybrid courses, we expect this modality to be an important part of the educational offer for upcoming periods.

Ecosystem of Educational Technologies.

For the implementation of the HyFlex+ Tec Model in the August-December period, an educational technology ecosystem was introduced, which incorporated learning platforms, remote laboratories and academic software.

Educational technologies for virtual classrooms were enabled through Zoom; class content was delivered through Canvas. The evaluation process incorporated Respondus LDB and Monitor as a platform for supervised examinations, and the integration of Zoom + Kaltura + Canvas was enabled for the Simultaneous Remote Face-to-face Hybrid Model.

Below are stats on integrated technologies for academic continuity in 2020.

Zoom Virtual Classrooms	Canvas Content Delivery	Supervised Examinations	Technologies for Simultaneous Remote Face-to-face Hybrid Model classes
10,235 virtual classrooms to teach over **22,000** groups.	**+22,000** groups with class content and activities.	Respondus LDB and Monitor.	Zoom+Kaltura+Canvas Over **2,000** groups in hybrid model

Technologies for Education. 2020.

Remote Laboratories and specialized software.

At the beginning of the contingency due to COVID-19, the Schools prioritized the software needs resulting from not having access to the facilities on campus and began to design a strategy for the use of remote laboratories and specialized software

This need was solved during the February - June 2020 period with the implementation of the following mixed strategy that incorporated various technologies for remote access by students and teachers to class sessions, activities and practices.

Strategy 1 Licenses to install in teachers' and students' equipment	**License in agreement** By contract, there are licenses already available to meet the needs.	**Free license** The provider offers or we request temporary licenses at no cost.	**Purchased licenses** New licenses are acquired.
Strategy 2 Remote access	**Virtual Application** AApplication installed on the cloud that the user accesses from their computer	**Remote laboratory** Connection to a campus computer that has specialized software.	

Technologies for Education. 2020.

Under this directive, a total of 1,005 groups and 21,907 students from different Schools and careers were reached during the January-June 2020 period.

School	Groups	Students
Architecture, Art and Design	87	1,742
Social Sciences and Government	39	810
Humanities and Education	235	5,252
Engineering and Science	427	7,602
Medicine and Health Sciences	32	1,379
Business	155	4,222
High School	30	900

Technologies for Education. 2020.

In the August - December period, remote access was enabled to 100% of the computer labs on campus to run practices, activities and class sessions. This made it possible to take advantage of the available specialized software, and to offer a service and academic experience equivalent to being within the institution's facilities.

The following table presents a comparison of the students' experience before the health contingency and during the implementation of specialized software for academic continuity.

	Before the contingency		During the contingency
1	Students searched for the location of the campus computer lab.	1	Student reserves the use of specialized software in a remote laboratory.
2	Students attended to the laboratory to do their practice, homework or take classes with the teacher.	2	From their home computer students connect to the campus network (VPN).
3	If there were computers available, students carried out their activity.	3	Students remotely log into the campus computer.
4	There was no reservation system and usage statistics were not accurate.	4	Students open specialized software and work as if it was installed on their computer.

Results of the use of remote laboratories in the different academic periods of 2020.

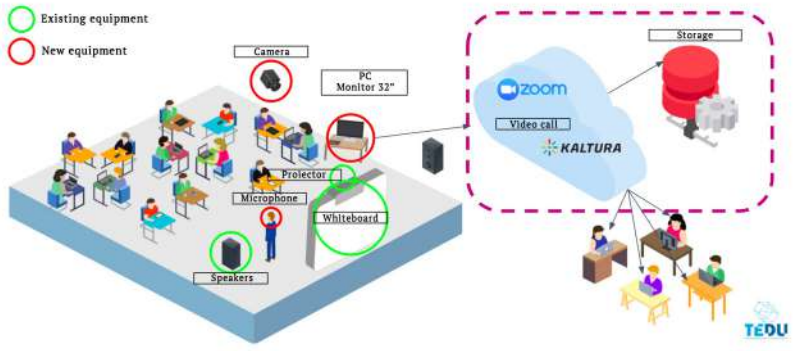
	February - June	August - December
Campuses with infrastructure	7	26
Computer labs enabled	26	166
Available computers	640	3,685
Specialized software	13	356
Students in sessions	21 2 (7 subjects)	6,747 (299 subjects)
Reservations for homework and activities	786	7,183

Technologies for Education. 2020.

Simultaneous Remote Face-to-face Hybrid Courses.

The health contingency confronted us with a new reality, in which we are required to maintain a different capacity of students in the classroom that enables social distancing. To meet this need, some technologies were integrated that would facilitate the new classroom experience for both students and teachers, under a hybrid face-to-face model.

Classrooms were equipped with various distinctive technologies and educational technologies for new experiences in the classroom. **Zoom** continues to ensure the delivery of the class to remote students; **Kaltura** enables storing class recordings and multimedia files that the teacher shares with students through **Canvas**.



Plan of classroom with monitor and projector. Technologies for Education. 2020.

Tec graduations.

In 2020, actions were taken not only to safeguard academic continuity; strategies were also designed to ensure other student experiences, such as the completion of their studies. Tec Forever and PrepaTec for Life became treasured activities for **High School, Undergraduate and Graduate students,** as they were ceremonies designed to celebrate, even during the health contingency, the culmination of a highly valued cycle.

PrepaTec for life.

Last May, 7,886 students from the 2020 generation of the 37 Tec High Schools in the country joined the **PrepaTec for Life** virtual experience, an event organized to celebrate the end of the school year.

At the ceremony, students, accompanied by their family members and high school authorities, received a message from Salvador Alva who, as president of Tec de Monterrey, congratulated the graduates and encouraged them to successfully face future challenges.



Conecta. Tecnológico de Monterrey. PrepaTec for life. May 29, 2020.

The guest speaker of the event was Marc Brackett, founder and director of the Yale Center for Emotional Intelligence, who, in addition to congratulating the young graduates, shared some tools to manage the emotional and social skills of the RULER methodology, which he developed and taught at PrepaTec.

This year, high school graduates received their diploma through Blockchain, a cutting-edge technology that facilitates authenticity verification of academic documents.

Tec Forever.

Likewise, in the month of June, the virtual ceremony **Tec Forever,** was held to celebrate the graduation of undergraduate and graduate students, who lived a different experience that will mark their time through the institution as a special generation, strengthened in resilience and leadership, as they graduated in a different situation than they had originally envisioned.

The event was broadcasted digitally from campus Monterrey. At 6:30 p.m., the virtual red carpet began, where students, together with their parents, shared experiences and received advice from directors of the institution.

Shortly after 7:00 p.m., the official ceremony began, in which José Antonio Fernández, president of Tecnológico de Monterrey's Board of Trustees, encouraged graduates to seek success.



Tec Forever. June 2020



The guest speaker at the ceremony was Hillary Clinton, former Secretary of State of the United States of America and former Democratic candidate for the presidency of that country, who highlighted in this generation of young people a comprehensive preparation to create their own path during this crisis and to help create a better future.

Likewise, renowned sports and entertainment figures such as soccer players Oswaldo Sánchez and Iván Zamorano, Olympians Luis Rivera and María del Rosario Espinoza, and actors Eugenio Derbez, Omar Chaparro and Joaquín Cosío, among others, sent messages of encouragement and congratulations to the graduates.

In this ceremony held remotely, the graduates celebrated the beginning of a new stage in their life, the end of their Undergraduate and Graduate studies. The now EXATECs received their degree through Blockchain at home and in the company of their loved ones.

Tec Forever

4,177 new underraduate level graduates **922** Graduate level graduates	The broadcast reached **885,935** people.	**40,000** people followed the live broadcast	**90%** satisfaction from students and parents

Department of Educational Innovation. 2020.





II. National Schools: The challenge to adapt to the digital world

School of Architecture, Art and Design

"Our community of teachers and students is committed to creating changes for the teaching of Architecture, Art, Design and Urbanism, by implementing new strategies with great creativity. In particular, the projects developed in response to the contingency caused by COVID-19 show a connection between art, science and technology as a starting point for finding solutions and changes that materialize in innovations that have an impact on the general population and reach wider audiences."



Roberto Iñiguez. National Dean.

As a way to adapt to the events of the contingency caused in 2020 by COVID-19, the School of Architecture, Art and Design undertook different actions for the development of academic continuity through the implementation of different models of digital education.

Some of the models of academic continuity developed by the School due to the contingency are described next.

Digital and prototyping laboratories.

Access to digital and prototyping laboratories is essential for the different careers of the School. As a result of the contingency, an effort was made to visualize critical needs to define an emergency route to facilitate remote access to the laboratories, detection of free alternative software that students could use on their personal computers, strategies for prototyping from home, as well as collaborative remote project review tools.

For this, and for the process of adapting the training units and subjects, different work meetings were held through the Academic Communities, spaces that became essential to share strategies, tools, resources and generate collective intelligence to adapt to the HyFlex+ Tec model.

One of the efforts resulting from this interaction was the creation of Padlet boards to share examples (images) of the challenges and problem situations of the training units.



Example of a structure created by teacher Ricardo Aguayo for his online course.

School of Architecture, Art and Design dialogues.

One of the tasks of the faculty of the Schools in the transformation towards the Flexible and Digital Model (FDM), was to establish a peer strategy focused on sharing good practices among its teaching teams. In the case of the School of Architecture, Art and Design, the following objectives were established:

1. Share and discuss good practices and examples in the implementation of the FDM.
2. Strengthen ties between academic peers (to strengthen national integration of the School) sharing various innovative aspects of their teaching practice in general.

The project was implemented as a program of weekly 60 minutes sessions, with the participation of volunteer lecturers with something valuable to share regarding the implementation of the FDM or an innovative resource that they have implemented in their teaching practice. Two to five teachers participated simultaneously in the sessions. Communication flyers with the basic information of each session were created and sent out nationwide.

Webinars about the City and COVID-19.

Tecnológico de Monterrey has undertaken a series of high impact actions for the society in times of the global contingency. One of these actions is the scheduling of workshops and seminars related to the impact of COVID-19 on issues of health, economy and business, government, entrepreneurship and comprehensive development. The School of Architecture, Art and Design City Strategic Initiative participated in these activities.



A slide of one of the presentations covered in the webinars.

In particular, some webinars were devoted to reflecting on the challenges and problems that the pandemic has presented for cities and people.

Various teachers and researchers from our School have participated in the sessions, as well as some special guests who work in institutions related to habitat and the city.

Microcredentials.

The Microcredentials Tec program is a pilot project that aims to recognize outstanding qualities and conditions of students during their academic career. This recognition seeks to contribute to the employability of our graduates. Tec de Monterrey awards badges to students who manage to demonstrate specific skills or knowledge through activities that meet specific quality criteria.

The pilot was implemented in the August-December 2020 period for the Architecture program students of the Tec21 Model, in which micro-credentials were offered in the areas of: inclusion, sustainability, identity and heritage, and representation and advanced narrative of architectural projects.

The quality criteria were established by a specialized team of Architecture teachers after several work meetings, where they defined the conditions that the student must meet to be eligible for each micro-credential



Face-to-face workshop held in February 2020, for the organization of Architecture micro-credentials.

So far, there are 107 students enrolled in Canvas in different micro-credentials, and it is expected that the program will be extended to all the School of Architecture, Art and Design careers for its refinement.

Area	Microcredential	Students on Canvas
Identity and heritage	Foundations of heritage historiography	41
Sustainability	Architectural socio-economic responsibility	18
	Bioclimatic architectural design	48

Creative Fund.

As part of the arts initiative, the Creative Fund was created, following a national call for projects from the Tec community that intersected art, science and technology. The creative fund of the laboratory seeks to promote, multiply and provide visibility to multidisciplinary projects within the Tec Community that intersect art, science and technology.

Due to the events of this year, the theme of the call was "The aesthetics of distance": exploration of disruptive technologies to access remote audiences. 116 proposals were received with representatives from the School of Architecture, Art and Design, the School of Humanities and Education, LiFE, PrepaTec, the School of Engineering and Sciences, the School of Medicine and Health Sciences, the School of Social Sciences and Government, the Business School and the Admissions Department. For this call, a strategic alliance was made with the organizing committee of the INC Mty entrepreneurship festival, to present the four winning projects of the 2020 edition.

Winning projects

They're not here
Robotic drawing system that creates an art piece that seeks to generate a social critique of the inequality that exists due to disappearances in Mexico. The work is made up of the faces of the disappeared individuals.

Aesthetics of distance
Proposal towards a change in production models, where the intersection between design and sustainability is a reality, guided by two main drives: bio-manufacturing and the maximization of space from folding furniture.

Wavesense
Installation consisting of an interactive capsule that projects the thoughts, sensations and feelings that a person (sender) generates when thinking about the experience of having physical contact with the other person (receiver).

Laboratory of online scene
Explores the generation of an augmented stage to present a digitally native scene, performed from a distance in real time.

A Digital Model for Artistic Residences.

The artistic residency program is promoted by the arts initiative; it is related to physical experimentation spaces such as the MUI (formerly Tec Museum) in Puebla, the Futures Center in Toluca and the Arte A.C. Laboratory in Monterrey.

This program brings together multidisciplinary, national and international artists with critical, active and known voices in the production and experimentation of contemporary art, and engaged in dialogue with science and technology. The health contingency has enabled experimenting with activities that challenge artists to innovate and reach wider audiences. In this sense, this distance modality has implied benefits for these initiatives to reach the Tec community in different campuses and regions.

Due to the contingency, the program evolved with two modalities to address the current situation caused by the pandemic, especially in regard to social dynamics, creative possibilities and materiality of electronic communication media that have become indispensable for everyday life. It seeks to generate learning and meaningful experiences for students through artistic practice and dialogue between disciplines; the artists in residence become a key element to trigger these explorations, hand in hand with their lines of research, trajectory and energy.

Other educational innovation projects developed by the School during the August 2019-December 2020 period were:

Project	Teachers involved	Students reached
Final Frame Virtual exhibition of the final works of the project-oriented subjects of our 2011 and 2017 AD Art degree plans nationwide.	+70	1,189
Sketch Nights Online sessions on social networks between professors from four campuses with the sole objective of drawing, having fun and sharing knowledge and drawing techniques with the Tec community and outsiders. All content is free to access and available on its YouTube and Instagram pages.	8	800
Creative Creatures (Novus) The project leverages the educational model based on competencies, by converting the student into an avatar (character) that represents them, as the student grows, achieves milestones in their academic experience and acquires skills. The "creative creature" acquires accessories that are associated with these skills, which represent, in a symbolic way, academic achievement and relate it to a tangible object with meaning. As the student progresses in their training, the creative creature is personalized and reflects the academic path of the student.	6	60

School of Medicine and Health Sciences

"The transformation of health professionals training has never been as necessary as during the COVID-19 pandemic. I am proud of the work of our community inside and outside the institution, honoring its call to serve society."



Jorge Valdez. National Dean.

The pandemic declared by the World Health Organization had a significant impact on economic and social sectors, including health and higher education. The schools of medicine and health sciences are conflicted regarding the duality of training health professionals who honor their vocation of service in patient care during this COVID-19 pandemic, and taking care of their health. Health professionals who participate in teaching face a wave of care needs for patients infected by this virus, in addition to representing a high risk to their health, which has a direct effect on their workload.

In this context, the **School of Medicine and Health Sciences** proposed a model of directives to describe the action plan in the face of the expansion of COVID-19 to reconcile, in an unprecedented way, the clinical work and the need for support for this new reality.

Directives of the action plan.

1	The protection and safety of the educational community should be prioritized through the reduction or suspension of non-essential activities, in order to adequately train them to face the health contingency.
2	Academic continuity with distance education through various stages ranging from preparation, design, implementation and evaluation, with an intensive use of technology, digital resources and simulation with virtual scenarios.
3	Communication and emotional support of the academic community to mitigate anxiety, uncertainty and loneliness of those part of the university: students, teachers, parents and support staff.
4	Response and social responsibility of health professional training institutions to contribute to the education, prevention and support for people impacted by the pandemic, allowing skill development in students.

Under these directives and the implementation of the FDM, FDM Plus and HyFlex+ Tec digital transformation models, the School continued to **serve 5,774 students** from its different undergraduate and graduate programs, with the **participation of 1,074 teachers.** Likewise, this year the link with professional practice from undergraduate, clinical specialties and graduate courses was maintained. We highlighting the following projects due to their connection with the community and the integration of elements of educational innovation.



TecSalud virtual open chair.

This project creates discussion arenas for different perspectives to promote transformations in a collective and individual plan, with the aim of offering a space for analysis, discussion and co-construction. Over 80 teachers, students and guests have participated as speakers and coordinators, as well as 216 national and international guest speakers. The project is coordinated by Dr. Jorge E. Valdez García, and has recorded a reach of 9,873 people to date, in 73.5 hours of programming.

Let's learn together about COVID-19.

Courses in partnership with Universidad Nacional Autónoma de México, the Mexican Association of Faculties and Schools of Medicine, the Mexican Association of Physicians in Training, and the BBVA Foundation. The goal of this project is to empower people to take charge of their health in the face of the COVID-19 pandemic, so that they avoid getting sick or making others ill. Professors from different departments and locations of the School participated as content experts and instructional designers, under the coordination of doctors Jorge E. Valdez García, Jorge Blando Martínez and María Eloísa Pérez González. Over 16,000 people have completed these courses.

Training for COVID-19 patient care through simulation.

Training in airway management by orotracheal intubation. The project is led by doctors Víctor Manuel Sánchez Nava, Carlos Chávez and Fernando Cantú. 130 residents of various specialties have treated urgent care COVID-19 patients.

Project Mediik.

Development of ventilators in conjunction with the School of Engineering and Sciences, which, through the Simulation Center, assisted with the loan of simulators and equipment. The project is led by Eduardo Flores Villalba from the School of Medicine and Health Sciences, and Eduardo González Mendivil and Ciro Rodríguez from the School of Engineering and Sciences.

Training in handling Personal Protective Equipment (PPE) for a safe return to Clinical Sciences.

Doctors Tania Garibay, César López and Elena Ríos participated in the project; from the professional nursing area, Silvia Ferriño, Irma Gutiérrez Jasso and Beatriz Ramírez also participated. To date, the national participation of approximately 500 students has been registered, since this training continues on a quarterly basis.

Educational innovation as a value proposition to improve the training experience.

With the mission of training internationally competitive, creative and innovative people through the knowledge, skills, attitudes and values that their profession demands, the School developed different **educational innovation projects** during the August 2019 - December 2020 period.

The following are some of the innovative projects developed and implemented by teachers from the different health centers and educational levels.

Project	Teachers Participating	Students reached
Virtual anatomy cases for 3D placement	1	170
“Guess who”	1	60
A Twitter thread	1	60
Teaching with memes	1	60
Coronabunker	1	60
Visit pass	1	83
Use of Holographic Telepresence	1	80

Virtual clinic: Social responsibility beyond academic continuity.

One of the strategies beyond academic continuity that characterizes the health area is social responsibility. Through academic partnerships, the School participated in the institutional program "Take care of your mind" by creating a virtual clinic for nutritional, medical and psychological counseling during the pandemic.

Cuida tu Mente

As an initiative from clinical science students and the voluntary participation of over 50 teachers coordinated by Dr. César Lucio, a model of accompaniment and help was developed by expert advisors, intended for all High School, Undergraduate and Graduate students, as well as parents throughout the country, giving medical and health advice to over 122 people, during the months of April, May and June 2020. Likewise, 2 Facebook pages were created, which grew to 2,300 followers, hosting over 200 posts and reaching over 52,000 people. An account was also created on Instagram with 40 posts, 1,500 followers and 2,700 profile visits.

Business School

> "Migrating to a digital format gave us the opportunity to break several paradigms in the TEC Business experience; to be closer despite the physical distance between our students, teachers and training partners; and to innovate, share best practices and constantly increase the value offer for our students."



Ignacio de la Vega. National Dean.

In addition to preserving the health and safety of our community, the health contingency faced us with the challenge of training one of the most numerous faculty groups of our institution, which not only went beyond their duties to provide our students with the best digital experience and extraordinary closeness, but also joined the social call of EGADE Business School and Tecnológico de Monterrey to provide their knowledge in favor of Mexico's necessary economic recovery.

Migrating to a digital format gave us the opportunity to break several paradigms in the TEC Business experience. The disappearance of physical borders has enabled us to be more flexible and agile, to be closer despite the physical distance between our students, teachers and training partners; and to innovate, share best practices and constantly increase the value offer to our students who await a conscientious return. Thanks to the online format, we have also developed Faculty programs to incorporate top-level international professors teaching in the Flexible and Digital Model (FDM).

Next, we present a few of the strategic educational innovation projects developed within the 2020 framework of academic continuity.

Snickers Challenge - Integration Block: Building solutions for the market.

The integration block "Building solutions for the market" had the objective of leading students to develop, at an advanced level, the sub competencies of market intelligence, value proposition, construction of scenarios and modeling, representation and visualization, development of innovation proposals, marketing planning and financing decisions. It also contemplates the development of the transversal sub competency of collaboration at an intermediate level.

During the 5 weeks of this block, students worked on the construction and acquisition of the learning contents included in each of the 2 learning modules and a challenge that combined knowledge with practice in connection with a national training partner; in this case, Snickers from the Mars company.



The national project developed during periods 2 and 3 of the August-December 2020 semester was designed by teachers Ana Valeria Calvo Castro (Sinaloa Campus), Mariana Alfaro Cendejas (Querétaro Campus), Eduardo Esteva Armida (Guadalajara Campus), Gerardo Tobías Acosta (San Luis Potosí Campus), José Antonio Tame Said (Santa Fe Campus) and Ján Rehák (Querétaro Campus). Also, 397 teachers participated as co-designers and adopters. The project reached 4,102 students from all campuses.

For more information on the project, wisit the following link https://cic.tec.mx/rca/mars/

Coppel Challenge 2020 - The role of business in society.

The Coppel Challenge 2020 asked which modifications to their business model should Coppel make to face the changes generated in the market by COVID-19, considering the relevant trends in the retail industry.



All the teachers who taught the block AD1000B - "The role of business in society" participated in the national project, during the first period of the August-December 2020 semester, reaching almost 4,000 students from 26 campuses, grouped into 750 work teams.

5 finalist teams presented their projects to high-level executives from Coppel. Through this experience, Business students developed the competencies: responsible business management, innovation and creativity, and self-knowledge and management.

Other educational innovation projects developed by the School during the August 2019-December 2020 period were:

Proyecto N.

This project connects students with current business issues, and enables them to apply their knowledge using a simulator. The students live the experience of executive decision making and have to present their results to a group of experts. The project had a reach of 74 teachers and 2,305 students.

Ibero-American Entrepreneurship Hyperloop.

A project that establishes support and collaboration actions to promote and reinforce the entrepreneurial spirit and innovation in students and academics with an international vision among the community of participating academic institutions, with a focus on digital culture and conscientious entrepreneurship. The project had a reach of 32 teachers and 850 students.

Organizational Behavior in Global Classroom.

The project, developed in conjunction with the University of San Diego, addresses issues related to emotions and stress management. Through the "Happiness Challenge" activity, students from Mexico, United States, Spain, Canada, China, Thailand and Kuwait chose and practiced, for 3 weeks, activities that helped to improve their levels of happiness. The project had a reach of 2 teachers and 57 students.

COVID-driven financial problems of TUI AG and the available options to solve them: A real-life case study.

An activity that provides students from the SRH Berlin University of Applied Sciences (Germany) and Tecnológico de Monterrey (Mexico) with a global class experience, by collaborating across different academic disciplines and countries. Students practiced communication, negotiation and problem solving in an intercultural context by completing a three-part COIL (Collaborative Online International Learning): an icebreaker, an intercultural team activity (analysis of a real business case) and a final reflection. The project had a reach of 2 teachers and 42 students.

"You got a deal" Tec & UT.

The objective of this project was for Tecnológico de Monterrey students to negotiate commercial agreements in English with UT Austin students through online interaction. The project had a reach of 1 teacher and 64 students.

Tec Global Classroom.

An activity to introduce an internationalization experience to the classroom. The COIL (Collaborative Online International Learning) methodology is used, which enables collaboration between teachers and students in such a way that participating students make use of technology and interact with other students online; it provides with international experience and is integrated into a class' learning process.

In this collaboration the case method was incorporated, which enabled the interaction of students to make decisions about the situation. The participating professors developed teaching skills and strengthened networking among peers from the participating international institutions. The project had a reach of 5 teachers and 282 students.

The contingency due to COVID-19 meant migrating 100% of EGADE Business School's activities to a digital environment. Academic programs, co-curricular experiences, admission activities and networking events were transferred to a virtual environment through different platforms.

In this context, Alternative Learning was implemented as a platform to offer alternative credentials and achieve academic continuity. Through a portfolio of products, the platform adapts to the needs of professionals who are interested in developing skills in a flexible, agile and personalized format.

In addition, to give continuity to the multiple academic and student life activities, EGADE Business School started this year the operation of its immersive virtual campus through VirBELA, a platform used to hold master classes, forums and innovative online bootcamps, using it on 25 % of classes in the MBA and Master in Business Management programs.

Virtual reality applied to educational events: immersive virtual campus through VirBELA.



Lecture hall in VirBELA.



Dance exercise to start activities.

The project known as **Virtual Reality applied to educational events** places EGADE as a pioneer School in this type of digital innovation projects by providing innovation through virtual master classes, boot camps, workshops, student forums, admissions sessions and much more, facilitating collaboration and strengthening the commitment of its alumni, students and future generations in a completely remote manner.

Continuing with the mobilization towards educational innovation, during the August 2019 - December 2020 period, EGADE Business School developed various educational innovation projects in which 154 teachers participated as authors, co-authors and / or adopters, reaching over 4,680 students and approximately 200,000 external users.

Some of the innovation projects developed are mentioned and described in the following table:

Project	Teachers participating	Students involved
Virtual Reality Laboratory	10	200
LiveOnLine	8	320
EGADE Capsules	100	4,000
Online bootcamps	4	160
MOOCs	32	*200,000

*External users

Virtual Reality Laboratory..



In December 2019, EGADE Business School and Samsung Electronics Mexico inaugurated the first area dedicated to virtual reality immersion at EGADE, Monterrey Campus.

This room seeks to provide knowledge, access and understanding about how virtual reality tools at the service of organizations can make businesses grow. Students become aware, explore and apply the benefits of this technology in their workplace and/or entrepreneurship projects to trigger creative initiatives both in their studies and in their working life.

Online bootcamps.

Starting August 2020, online bootcamps were incorporated as a new online course offer. Characterized by intensive and practical dynamics, the courses are carried out under a combination of online platforms such as VirBELA and Miro, with constant communication through channels such as WhatsApp and Slack, which offer different visual stimuli to students relevant to the tools they use and the context in which they live, in addition to developing teamwork and self-learning skills.



School of Humanities and Education

"When combining an institutional culture oriented to innovation with the compelling need to adapt to an unprecedented environment, surprising things happen: subtle and flexible educational spaces, creative and generous teachers, willing and resilient students. There's nothing like putting your talent to the test. And the rest is the least of it."



Enrique Tamés. Nacional Dean.

The School of Humanities and Education participated with the academic continuity model to face the contingency due to COVID-19, through different strategic projects that enabled innovation in the educational practices of its teachers, maintaining its commitment to training quality.

Below are some strategic educational innovation projects developed within the framework of academic continuity.

United by stories..

During the August-December 2020 semester, the School participated remotely with the academic continuity model in the Creative Writing Block, which was carried out over five weeks through virtual sessions. Far from closing possibilities of experience and learning for the 20 students participating in the School of Business and School of Engineering and Sciences, it actually opened new contacts and relationships with physically distant actors.

The block was based on the challenge-based learning methodology. As an initial challenge, students created a digital book as a personal creative writing project; they agreed to write a narrative for a special reader: the patients at the Central Hospital (COVID-19 hospital) located in the city of San Luis Potosí.
Several technological tools were incorporated in an organic way in the challenge, tools that enabled the openness and fluency of a flexible and horizontal communication.



Creation of an interactive photography studio for classes in the Flexible and Digital Model (FDM).

The project consisted in the configuration of a space (the basement of the house of Campus Monterrey's teacher José de Jesús Rodríguez Sandoval) for a photography studio that enabled students to have the perception of being in the physical laboratory and replicate the photographic exercises of the course aided by the teacher and using technology.



As a result of this preparation for classes in digital format, the students were able to see, from their computer and through the teacher's laptop camera (on a work table built for that purpose) the general view of the studio and what it involved: camera position, subject, lights, cyclorama and accessories, using Canon software that enables students to observe through the camera, the configuration of the camera and the subject.

During the February-June and August-December 2020 periods, 160 students of Photojournalism, Commercial Photography and Advanced Photography participated, both from Tec20 and Tec21 study plans, as well as 10 teachers who participated in the entry blocks of the Creative Studies area.

Virtual reality brain resource.

The brain resource in virtual reality is intended for students to understand and interact with the structure and functioning of the human brain, and with the sections that are activated during the processes of attention, memory, motivation and emotion.

It is a virtual representation of a child's brain where its different parts are accessed with an explanation of how it works. The resource explains which parts of the brain are activated when the child pays attention, plays, is hungry, etc.

The resource was implemented in the August-December 2020 period, in the Analysis of educational problems block of the Educational Innovation Program. For the next semester, the resource will be used in the Cognitive Psychology course of the Master of Education program the School offers.



Immersive sound theater: a dialogue with blindness.

This project aims to produce a dramaturgical work that focuses on creating an immersive sound experience, through the design and implementation of a 3D audio system. The script is developed in collaboration with the company "Associations for blindness", which is devoted to exploring the performing arts from their blindness condition.



As part of the project activities, an immersive sound experience was carried out online in November 2020. This experience was inclusive for people with blindness; 300 students and 10 teachers from Campus Estado de México participated in it.

A scientific research process will follow to explore if the 3D sound system designed for this project offers a plausible solution to the problem of fatigue and the physical, mental and psychosocial consequences caused by forced teleconferences, due to social distancing.

Other educational innovation projects developed during the August-December 2019 period and during 2020 were:

Audiofitness Education. Educational channel for music production.

The channel helps teachers who teach audio, music and production content through tutorials for the use of remote software. The channel has 279 subscribers and in the last month, reached 2,767 views of their videos to solve technical problems for the use of Zoom and digital audio Workstation.

Project leaders: teachers Mijael Gutiérrez and Diana Urquiza from Campus Santa Fe and Mexico City, respectively. The project involved 15 teachers and 700 students.

Chair of Strategic Communication.

As a consequence of the implementation of the Flexible and Digital Model (FDM) for academic continuity due to COVID-19, during the August-December 2020 semester the Department of Media and Digital Culture held a chair of specialists on the subject of Strategic Communication, aimed mainly at students of the Communication program. The Chair of Strategic Communication at Campus Estado de México was created with the objective of connecting students with various career specialists within the communication field.

Project leader: Fernando Ignacio Gutiérrez Cortés from Campus Estado de México. The project involved 1 teacher and 12 students.

Art gallery.

The students developed their own art gallery, using the Occupy White Walls video game, and carried out different activities typical from such a space. They acted as "curators" of the artistic content, planned visits, chose music, arranged the space distribution and architectural design and selected the pieces.

Project leader: Narce Dalia Ruiz from Campus Toluca. The project involved 1 teacher and 25 students.

TECMUN.

TECMUN or Tec Model United Nations is a representation of the United Nations System. High School, Graduate and Postgraduate students from Tecnológico de Monterrey and other universities in the country and abroad participated. The students became Delegates who took part in debates and negotiations on topics of the 2030 agenda related to the programs of the subsidiary bodies and commissions of the United Nations.

Emergency call.

As final evidence of the Audiovisual Narrative Training Unit of the Creative Studies entrance, the fiction short film “Emergency Call” was made remotely in its entirety, due to the contingency caused by COVID-19. The first condition for the production of the audiovisual short film was for the group to not travel or meet face to face. A short film was written where the main conflict was based on remote communication. The students wrote the script and recorded the short film using only video calls.

Project leader: teacher Adrián Alfonso González Camargo from Campus Morelia. The project, carried out in the third February-June 2020 semester period, involved 1 teacher and 15 students.

Project leaders: teachers Mónica Sandoval and Natalhí Alvarado from Campus San Luis Potosí. The project involved 5 teachers and 78 students.

Training of transversal skills in times of COVID-19. Use of immersive experiences to recognize gender violence.

This project highlights the implementation of immersive experiences through a 360 Virtual Reality video, for the development of a class focused on the development of the awareness and sensitivity competency towards gender violence issues.

Project leader: teacher José Carlos Vázquez Parra from Campus Guadalajara. The project involved 1 teacher and 28 students.

Developing English Language Skills and Ethics at the VR ZONE.

In the August-December 2019 semester, students participated in the Virtual Reality Zone to develop their language skills in English in an immersive way, through the project “Ethical Aspects of Ocean Acidification”.

Project leaders: teachers Ivonne Braun Taber Bazán and Aura Elena Moreno Guzmán from Campus Puebla. The project involved 2 teachers and 35 students

Myth Hunt.

This project was carried out through virtual and remote elements with the aim of analyzing the social phenomenon involved in the pandemic, connecting academic issues with current reality and thus creating an interesting space for dialogue and disciplinary recognition.

Project leaders: teachers Ramón Santillana, Luisa Lloret and María José Vázquez from Campus Querétaro. The project involved 3 teachers and 50 students

The magic of signs in art and culture.

With the aim of finding signs and meanings that would bring students closer to our culture and to provide them an experience outside of the digital sphere, the project "The magic of signs in art and culture", emerged from the Semiotics course. The workshop for the elaboration of an alebrije, held in coordination with the Land of Artists organization, provided students with a practical vision of the Semiotics subject, as well as a tangible example of how we can contribute to improving society through art.

Project leaders: teachers Anel Torres Rodriguez and Mayra Zamorán Tapia from Campus Querétaro. The project involved 2 teachers and 46 students.

School of Social Sciences and Government

"A group of leading academics responded with excellence to an unexpected challenge."



Alejandro Poiré Romero. Nacional Dean.

During the August 2019 - December 2020 period, the School of Social Sciences and Government designed and implemented educational innovation projects that made it possible to face the contingency due to COVID-19 and offer students a quality learning experience through various digital models implemented.

Some of the strategic educational innovation projects developed within the 2020 framework of academic continuity are described next.

Mixed Digital Social Sciences – The option of taking the entry block of Social Sciences programs from any campus.

The School of Social Sciences currently offers students the possibility of taking the CIS-Tec21 entry block in 9 of the 26 Tec de Monterrey campuses. However, we asked ourselves: how can we ensure that students from any campus are able to take the CIS entry and help more students be part of the Tec experience?

We created **Mixed Digital Social Sciences** by combining the innovative formats that emerged under the context of 2020, such as the Flexible and Digital Model (FDM) or HyFlex+ Tec Model, the digital formats that we already had before the pandemic, and with support in the acquisition of teaching techniques and resources by our teachers. It is a format that will enable all Social Sciences and Government students to take all the Training Units of the first three semesters (two for Law students) digitally, from any campus, to later select a campus where their program is taught and conclude their training in a face-to-face modality.



Mixed Digital social sciences

To ensure academic quality, the most outstanding and renowned distance learning teachers participate with the most innovative designs of the Training Units. Students participate digitally in monthly talks with our most renowned teachers, in activities and workshops and as part of digital communities designed specifically for them.

Tec life, an essential part of the experience of our students, has not been pushed aside either. **Students of Mixed Digital Social Sciences** will be able to join all the activities and benefits of **LiFE** and make use of all the facilities on their Campus. In addition, they will have the option of taking some of the Training Units in face-to-face format, taking advantage of the benefits of the Tec21 Model in general education subjects, red blocks and Tec weeks, available on all campuses.

Other benefits of the format are:

- Postponing the change of residence, since the selection of campus where they will study their specialty will not happen until the 4th semester (3rd for Law students).
- Possibility of taking Training Units in summer or winters in a face-to-face scheme, on other campuses and even abroad.
- Activities and digital communities designed specifically for students of the Mixed Digital Social Sciences entry block

The first stage of the Mixed Digital Social Sciences entry block will be available in the August-December 2021 semester, in the following campuses: Aguascalientes, Morelia, León, Sinaloa, Zacatecas and Cd. Juárez, to later be incorporated into the rest of the campuses.

Educational innovation for hybrid courses.

In the context of the COVID-19 epidemic, the study "Design process and redesign of a hybrid STAR course" was carried out. In the study, the didactic strategy of the Tec21 Model General Education “Citizenship Education” course was documented, which facilitated the transfer of courses to digital format without setbacks.

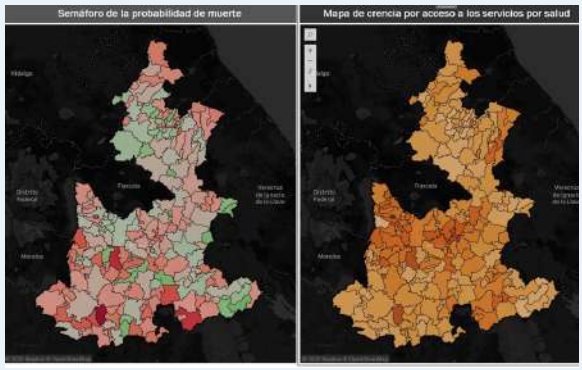
The study made it possible to document findings in terms of good practices for hybrid courses, such as holding special contact sessions with students from each campus via Zoom to generate personalized knowledge; the design of pop quizzes during the teaching of the class that enable exploring the level of knowledge of the students and reinforcing the concepts learned; interaction tasks in class that combine 20-minute presentations with group activities; high-profile guests who prioritize connecting generational interests; alignment of assessable activities and evidence in order to ensure the acquisition of competencies; updating of problem situations and opening a range of options to tend to the interests of students, and the improvement of evaluation mechanisms.

As a result of these changes, when comparing the August-December 2019 and February-June 2020 results of the ECOA student survey, an increase in the performance evaluation in all questions is evident, with particular attention to the support received by the teacher and the general experience of the course. Student performance, measured through the indicator of the percentage of students who passed the subject and obtained grades above 90, also improved significantly between the two semesters.

The project was carried out by Dr. Cintia Smith, from the Department of Political Science and International Relations of Campus Monterrey, teachers Karina Onofre and Mónica Contrino, from the area of Educational Innovation and Dr. Jorge Membrillo-Hernández, from the Writing Lab of Campus Ciudad de Mexico.

Data Laboratory and new COVID-19 control panel.

Students and teachers from the Department of Economics, Central South region, made applications in Data Science for FIRA (Banxico), BANORTE and NAFIN, through the "Data Laboratory" (formerly Programming Club) initiative, started in 2019 by Ignacio Ibarra and Enrique Navarrete, both teachers from the Economics Department.



The presence of COVID-19 motivated the creation of a control panel that enables the identification of risk areas in the state of Puebla. For this purpose, official information (INEGI, Health Secretariat, CONEVAL, Executive Secretariat) and models that enable estimating the probability of contagion, mortality and lethality were used.

With this experience, the School of Social Sciences and Government contributes to the design and implementation of public policies based on a scientific method.

Strategic projects developed from the COVID-19 contingency.

Next, two strategic projects developed by the School of Social Sciences and Government that go beyond academic continuity and also highlight educational innovation and student involvement are presented.

#DenunciaCorrupciónCoronavirus

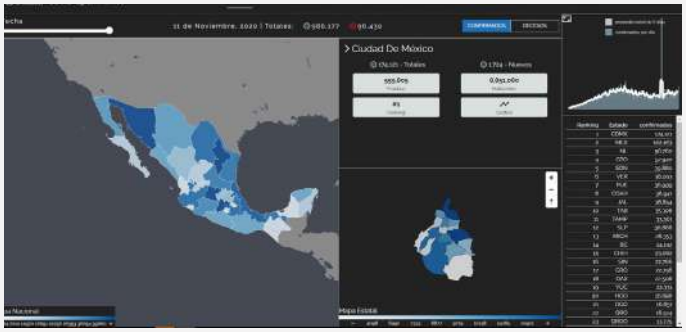


Tool created by the Transparency and Anticorruption initiative of the School of Government and Public Transformation, and by the civil association and training partner Human Rights and Mexican Strategic Litigation.

#DCC was designed for anyone to report acts of corruption related to the detection, care and treatment of the COVID-19 virus, as well as to record the operational failures of medical service providers, both in public and private hospitals.

The objectives of #DCC are to generate statistical information on the experience of corruption and operational failures in the health sector; to encourage whistleblowing in our country; to help, free of charge, the person who reports it, to present their complaint and assist them in the process and follow-up, and to alert the authorities to conduct the relevant investigations.

www.mexicovid19.mx



The www.mexicovid19.mx project is an initiative to disseminate the official COVID-19 figures to the public, through interactive visualizations on the evolution of the pandemic.

The initiative arose from a collaborative process between students and teachers of the course Technological Tools for Social Sciences in the classroom, at the beginning of the pandemic in Mexico, who organized to jointly build a COVID-19 figures display board.

The guiding principles for the construction process are:

- A platform accessible to anyone with an internet connection and a digital device (computer, phone or tablet).

As of November 2020, #DenunciaCorrupcionCoronavirus registered over 5,000 visits to the page and over 350 reports. The project was selected from among 850 works from around the world as one of the 100 peace solution projects at the Paris Peace Forum 2020.

For the testing stage of the tool, we had the support of teachers and students of the Social Sciences and Government School, as well as the collaboration of several students from the student groups The Power of One, campus Laguna and Only for the Incorruptible, campus Puebla.

- A free platform updated daily with official information from the Health Secretariat of the Federal Government of Mexico.
- Interactive displays, with additional information displayed on clicks.
- Representation of infections in a spatial (digital mapping) and temporal (evolution of positives and deaths over time) manner.

The site presents a digital map of Mexico where users can interactively consult confirmed cases and deaths by states and municipalities from April 2020 to date.

Other sections of the site present research notes on COVID-19 prepared by teachers and students, as well as a series of interactive graphs to observe the incidence rates by state. The platform was visited by 40 users per minute at the height of the pandemic.

In the initiative, 38 voluntary students from the School of Social Sciences and Government and the School of Engineering and Sciences participated, as well as 7 teachers from both Schools. The project has served to strengthen interdisciplinary collaboration between Schools and put into practice technological tools to generate social value.

School of Engineering and Sciences

"The transition to a digital model has put us to the test in academic and technological terms. However, we learned in an agile manner that enabled us to provide good service to our students and to continue with high impact activities."



Manuel Zertuche. Nacional Dean.

In March 2020, the School of Engineering and Sciences, like other Tecnológico de Monterrey Schools, had to face the issue of academic continuity due to the contingency caused by COVID-19. One of the biggest challenges was that the School had 23,124 student-courses that were taught in a laboratory. However, our remote labs initiative has enabled students to continue learning and developing competencies in a different way, that is, through a digital experience.

The teachers, through the academic communities, took initiatives in the different realities of each subject or training unit and it was possible to coordinate the academic continuity in these courses through demonstration videos that the teachers created and made available, the use of open access simulators and through the purchase of licenses, use of software in physical laboratories through protected connection and use of remote laboratories.

The actions taken were many, both in the courses and training units with a laboratory component, but also in those that lacked this component. The academic communities of the training units and disciplines that were created helped teachers to communicate and share best practices.



To measure the success of our work as a School, a student survey was implemented with the objective of creating a description of the teacher's practice and the student's experience, which would enable us to have a general vision of what the teacher did in the Flexible and Digital Model (FDM), and to analyze the differences in teaching practice in relation to the type of course taught; the type of contract of the teacher and the region to which they belonged; and, finally, evaluate the student's academic experience and analyze the factors that influence their experience in this model.

There were over 5,000 responses and, after a rigorous statistical analysis, it was concluded that the students valued the work and effort made by the teachers, and that the factors that most influenced the perception of learning and success of the course were those coming from the teacher.

The students assessed that the class was active, with their participation in the process, that the teacher had activities that motivated them to participate, that they maintained good synchronous and asynchronous communication, and that they showed commitment in their teaching of the distance class. This result has served to communicate and train teachers and improve teaching practice in synchronous distance education, an essential part of the model that we are following today.

Red blocks.

Another project developed in the context of academic continuity was the initiative of the elite national red block, which has the objective of involving the most students with training courses / units, with the best teachers, regardless of their location. The pandemic provided the particular ingredients for this initiative to take place. On the one hand, the Flexible and Digital Model enabled us to have a teacher in one place and students in another. During the first months of the pandemic, we learned the best practices for synchronous delivery at a distance, the first ingredient for academic continuity.

The great experience of the Educational Innovation Department of the Vice-rectory for Academic Affairs and Innovational Education, as a source of advice and feedback, was another ingredient. In addition, the teaching of elite groups of courses from previous plans was the prelude to this initiative. The pedagogical design between the Vice-rectory and the School of Engineering and Sciences was an essential element. Lastly, recruiting a number of participating teachers with an adventurous spirit and proven experience was the single most determining factor in making this happen.

The School of Engineering and Science's red blocks, officially known as exploration blocks, are training units that have the objective of reaching the greatest number of students with outstanding teachers in the School, homologate the standard of teaching and academic quality, and promote the participation of students at the national level with the interaction of students from different campuses. An administrative consequence of this model is added efficiency, by uniting small groups from different campuses, in groups of 150 students enrolled nationwide, with the participation of six teachers.

The team is first made up of two tenured teachers who design and teach the modules, taking responsibility for preparing activities, materials and tools, and giving advice on the challenge from their disciplinary perspective. They design the Canvas Evaluation plan and monitor student participation. In addition, the team is completed with four advisory teachers who give personalized attention and assistance to some of the students, grade their work and provide feedback on activities and projects, attend and solve administrative matters, and manage the technological platform.

All teachers are responsible for providing advisory hours available to all students, similar to how it happens face-to-face; that is, the teachers' office must be available at a specific time so students can ask questions about any academic or administrative issues.

The red blocks implemented in this format are:

- Biotechnological tools in solving food and health problems.
- Alternatives for the development of the energy sector.
- Causes, consequences and solutions for climate change.
- Science Technology and Society.
- Smart logistics networks.
- Methodologies for technological innovation.
- Discovering the IoT and its applications.
- Data analysis for decision making.

In the August-December semester of 2020, 25 groups of elite exploration blocks were taught with the participation of 2,830 students from all Schools and regions. At the end of the period, 89 % of the students indicated that the value they place on having renowned professors from other campuses in the exploration block is positive or very positive, and that the main objective of having a great impact from the renowned professors with students from different campuses was achieved. Also, 77 % of the students indicated that the value they place on having classmates from other campuses in the exploration block is positive or very positive. Another relevant result was that 89 % of the students indicated they can see that the corresponding area of their block is important for the development of technology and the improvement of society, a relevant aspect in the exploration of students in disciplines outside of their usual environment.

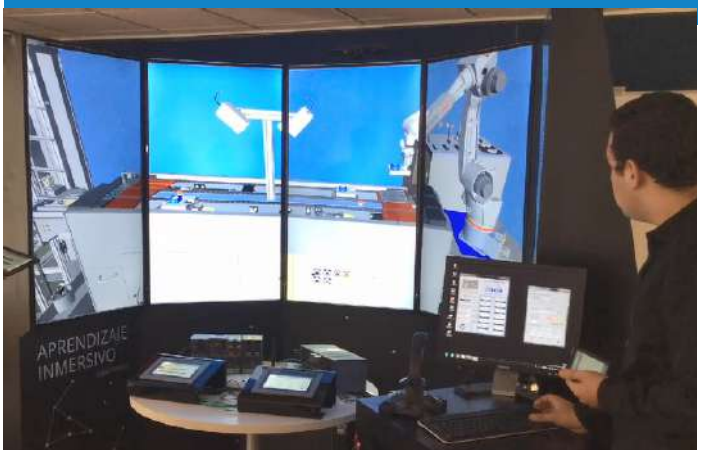
Making Biodiesel with Virtual Reality



The project "virtualized" the biodiesel production experiment to make it accessible to all students, in a distance modality, to overcome the lack of access to laboratory experiences due to infrastructure limitations and the lack of motivation, attention and interest in the course. Making this didactic resource available to all groups on all campuses made possible measuring and analyzing the effect of the use of this resource on student interest and participation, as well as on their academic performance.

The first prototype of the project was implemented in the August-December 2019 period, at campus Monterrey, and in 2020 at the national level, with the participation of 72 teachers and reaching 1,160 students.

Remote, Cyber-Physical and Virtual Training Platforms



Under the concept of Innovation and Technology for Engineering Education, the project presents three technological platforms to improve practical skills of students, meet the needs of flexibility and mobility, ensure academic continuity and a lower cost of: remote **laboratory platforms** for distance education and engineering training for today's flexibility and mobility needs; **cyber-physical laboratory** platforms for a highly effective and low-cost solution for expanding laboratory facilities on campus; and **virtual laboratory** platforms to emulate a complete laboratory on a personal computer.

During the August-December 2020 period and as a result of the pandemic, with the Virtual Laboratory platform called Lab @Home, 32 teachers from 15 campuses were involved in 6 different courses, reaching a total of 565 students.

Tangle: an educative suite to boost interest and learning of undergraduate students in quantum information.

The project is focused on the creation of an education suite made up of two MOOCs in the fields of Information and Quantum Computing, and a couple of spaces for interaction to work with research projects with students. Through this suite, since 2017 a national quantum Information and Computing workshop has been offered which, in a hybrid training week at Tangle, is complemented by Week I activities for the students who enroll in it. Some of these students join the research group under the research modality and carry out original research that ends in a scientific publication. Some of these students remain in the group for graduate studies with an already advanced knowledge of the subject that enhances their productivity. The suite, however, enables entry at any level and is not necessarily tied to the aforementioned path.

High School

"We provide teachers with the tools and training they need to maintain or increase their bond with students under this new remote modality, in order to strengthen their development in disciplinary and training competencies."



Pedro Luis Grasa.
PrepaTec Vice-president.

In order to ensure the academic continuity of the PrepaTec educational-training process and considering the prevailing environment at the national and global level, as of March 2020, pedagogical, didactic and technological initiatives were incorporated and implemented to face current and future challenges due to the COVID-19 contingency, seeking a relevant academic service that favors compliance with the development profile of both our students and teachers.

Within this context, the School developed strategic projects for academic continuity to identify and implement the best instructional design of the courses that evidenced the development of the disciplinary and formative competencies of the students, fostering active, adaptive and experiential learning spaces, as well as alternate assessment strategies to support the best experience for students and faculty.

Another strategy enabled attending and responding to the weekly monitoring of the physical-emotional condition of the students, recognizing its importance for the optimal academic achievement of the students.

Some educational innovation projects developed by PrepaTec within the framework of academic continuity are presented next.



Summer20Teen.

The project was born from the need to create a digital, adaptive and active learning environment to face the health contingency the country experienced and that would also be attractive for PrepaTec students to continue with their studies during the summer 2020 period.

In the Summer20Teen experience, 364 national groups participated, made up of teachers and students from various high schools.

The courses were designed and implemented through Canvas, using Zoom to teach classes with the support of technological tools such as ALEKS and WebAssign for the area of Mathematics and PEIm and StartUp and Learning Apps in Foreign Languages.

Another feature was the integration of a new schedule concept with synchronous and asynchronous work sessions, following a four-week modular design under a thematic axis. During these weeks, each group was accompanied by a teacher / tutor to achieve a timelier monitoring of the emotional and academic state of the student. In addition to this, 180 teachers opened multiple advisory spaces that helped students to reinforce the learning of their summer courses. To give a comprehensive experience, an enriched Life@Home offer was provided.

As a result of the Summer20Teen, 98 % of the students evaluated their experience positively and highlighted the role of teachers and tutors in their comprehensive experience. This project marks a milestone at PrepaTec, with experiences and lessons learned that will strengthen the semester hybrid model. Another of the points valued by students was being able to count on a national experience of the 36 high schools, interacting with teachers, tutors, and classmates from all across the country.

Below are indicators of the project's reach during 2020.

Students	Courses	Campuses	Teachers
5,536	364	36 PrepaTec campuses	347

Migration, design and adaptation of courses on Canvas-eLumen.

In June 2020, the process of design and adaptation of the courses for the August-December 2020 period (1st, 2nd and 3rd semester) began, adapting to both a remote and hybrid modality (HyFlex + PrepaTec Model).

Teams made up of 42 academic leaders and 217 PrepaTec teachers nationwide participated in this project. The courses were designed and adapted in a collegial manner, capitalizing on the functionalities provided by the Canvas-eLumen platforms, and their efficacy to demonstrate and evaluate disciplinary and training competencies.

During the month of November 2020, the migration, design and adaptation of the courses from 2nd, 4th and 6th semester continued, based on the experience acquired during the courses taught in the summer period and the August-December 2020 semester.

Reach stats during 2020.

Students	Courses	Campuses	Teachers
27,446	7,336	36 PrepaTec campuses	2,562

Physical-emotional monitoring of PrepaTec students.

Due to the importance of knowing and monitoring the physical-emotional state of over 27,000 PrepaTec students, we used the MoodMeter tool of the Center for Emotional Intelligence at Yale University called RULER. Using RULER weekly, each teacher / tutor defined the follow-up and accompaniment strategy for their students. Weekly student tracking and monitoring represents a population sample of 22,151 students, equivalent to 81 % of the total student population.

In addition to monitoring the physical-emotional condition of the students, the RULER webinar program for parents was implemented, with the aim of sensitizing and guiding them in this initiative as well. The webinars have had 1,848 participants to date, achieving over 15,000 views in the four sessions recorded on PrepaTec's Facebook Live.

Below are the stats of the project's reach, during August-December 2020.

Students	Campuses	Teachers
27,061 +1,800 parents	36 PrepaTec campuses	325 Teachers/ tutors

Complementary training to FDM Ready + PrepaTec.

The redesign of the courses for academic continuity required the incorporation of new tools and methodologies for their implementation. Such is the case of Alex, WebAssign and Facing History, for which teachers from different areas completed training workshops in synchronous and interactive modalities to develop the mastery of new tools.

This redesign made it possible to provide teachers with support tools for the monitoring and development of their students' competencies, in an agile and direct way. This enabled more than 1,500 teachers from the different high schools to complete their training requirements, during August-December 2020.

Blockchain implementation to ratify PrepaTec graduation diploma



Seeking to be at the forefront of technology, PrepaTec became the first high school in the country, and one of the first in the world, to deliver their graduation diploma to over 7,800 students who graduated in the 2020 generation, through an electronic format that includes the use of blockchain technology to facilitate the authenticity verification of academic documents.

Continuous Education

"Today, more than ever, we have discovered that we are living in an unstable, uncertain, complex and ambiguous world. We need leaders who are willing to identify opportunities, experiment and validate, and then scale up, innovative solutions for the public we serve."



Jorge Blando Martínez.
Vice-Rector of Continuous Education.

The new normal has led to a migration from face-to-face continuous education programs to a virtual modality. Aware that our clients have different needs and learning styles, at Tecnológico de Monterrey we have designed a new option of virtual programs, known as LIVE programs to complement the existing ones. In addition, as part of a customer-based strategy, this year the measurement of the NPS (Net Promoter Score) was established, as an indicator of the voice of our customers and thus be able to provide memorable experiences.

Some of these actions taken are described next:

LIVE programs.

On March 15, 2020, the design of 10 LIVE programs began and in May the implementation of their first generation was carried out. Given the satisfaction response from users, one more group was opened each month and, in some cases, a new group every 15 days. As Phase II, the design of 11 more programs began in July, carrying out their delivery in September and October. To date, 86 programs have been offered, 10 of them already concluded with an NPS of 86 and with very good comments from the participants. A process of permanent continuous improvement is followed with new changes introduced in Phase II.

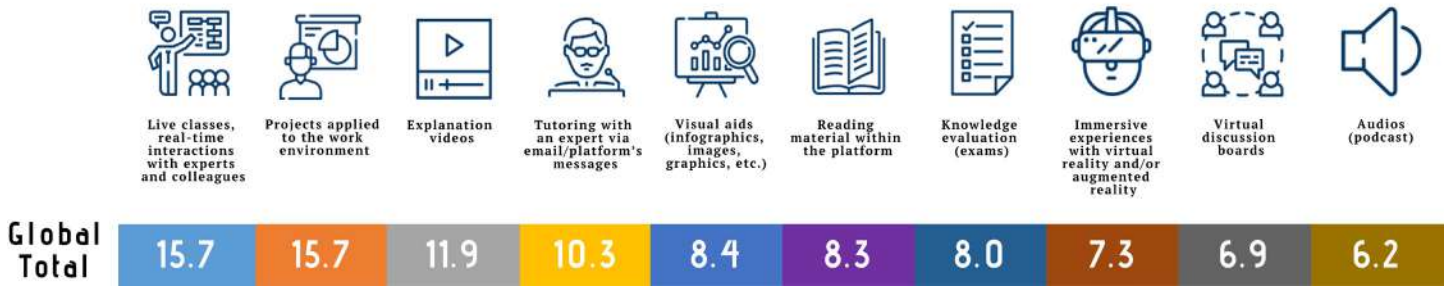
LIVE programs were designed taking into account:

- That behind the need to learn from all participants in our programs, there is a need for improvement in their personal / professional life that needs to be worked out for the program to be truly of value to them.
- That the importance of a program occurs to the extent that the satisfactory perception of the participants is achieved; the long-term learning of knowledge and skills with the potential to transform their reality; behavioral changes in personal / work life as a consequence of the program, and results of value for the person and organization they collaborate with.

Based on this, the general objective of every program was established: to promote relevant learning with long-term staying power that transcends into daily life, adding value to the participant and the organizations they collaborate with.

Each module begins with an awareness phase (Inspire) about the relevance of the module to their daily life and then the learning experience is developed in two cycles, typically one per week

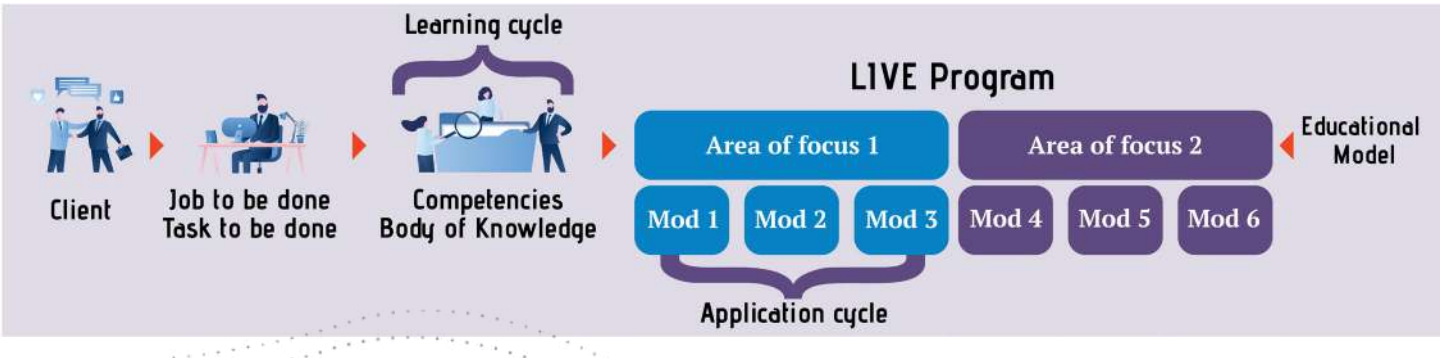
The following image shows the mentioned characteristics, ordered from highest to lowest relevance.



The first 7 items on the list were selected. These elements were integrated into a pedagogical model based on the **INSPIRA model** developed at Tecnológico de Monterrey to design continuous education learning experiences with long-lasting impact that transcend into daily life, adding value for our institution and for the organizations it collaborates with.

The design process of the program begins by clearly identifying the client and their central need: their Job-to-be-done (JTBD), what they want to happen in their life, the reason they come to the program to achieve it. Their JTBD is broken down into task-to-be-done (TTBD), the tasks that must be carried out to achieve the JTBD. For each TTBD, the competencies that the person needs to develop are identified and synthesized in a program that consists of several modules, grouped in areas of focus.

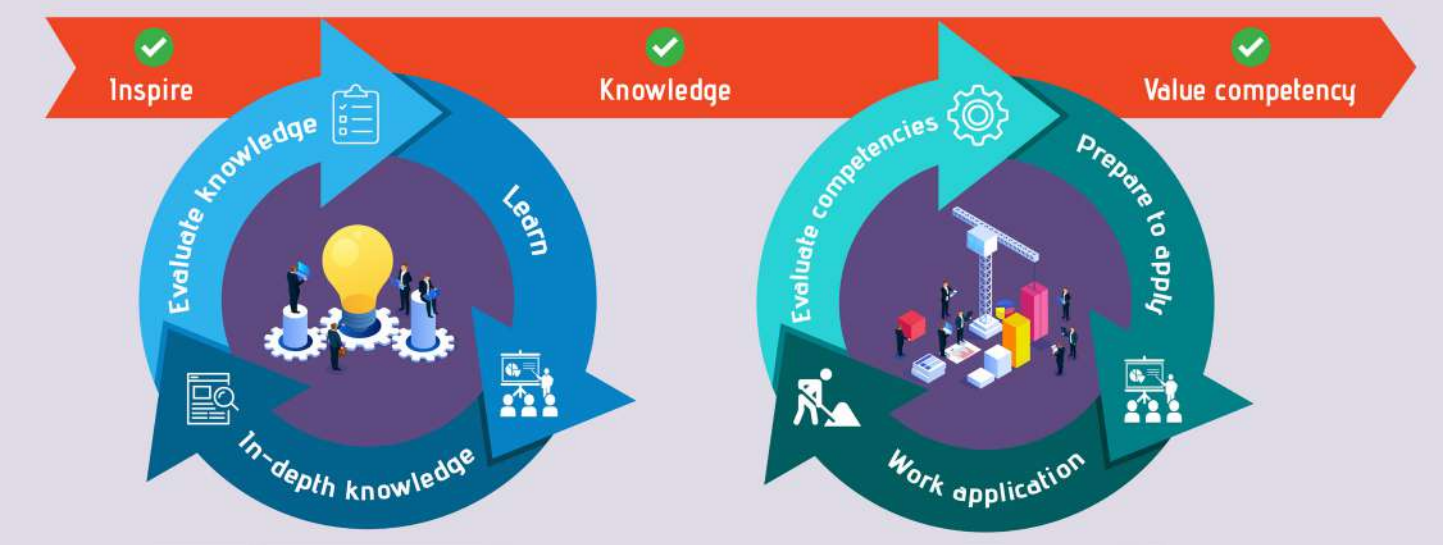
The following image shows the components of the LIVE program design.



Each module begins with an awareness phase (Inspire) about the relevance of the module to their daily life and then the learning experience is developed in two cycles, typically one per week.

A first learning cycle aims for the participant to learn relevant knowledge to be able to develop the task-to-be-done, in the appropriate way, to solve the need for it. The second application cycle encourages the application of what has been learned in daily life.

Each cycle is developed through a combination of synchronous session-asynchronous learning and evaluation.



The experiences of the **learning cycle** are the following:

Learn	In-depth study	Evaluate knowledge
Synchronous session of the expert with the participants in small groups for the learning of the essential concepts. Includes expert teaching and interactive active learning activities to strengthen subsequent retention of concepts.	The participant **complements their learning asynchronously** (in their own time and schedules) through microlearning capsules (short videos, readings, infographics, etc.) expressly designed for the program, made with professional audiovisual production and available through a technological platform.	The participant carries out an **evaluation of their learning** through the platform. If the learning was successful, they are ready to move on to the application phase. If not, they have a **second chance** to strengthen their learning by reviewing the materials and resubmitting the evaluation.

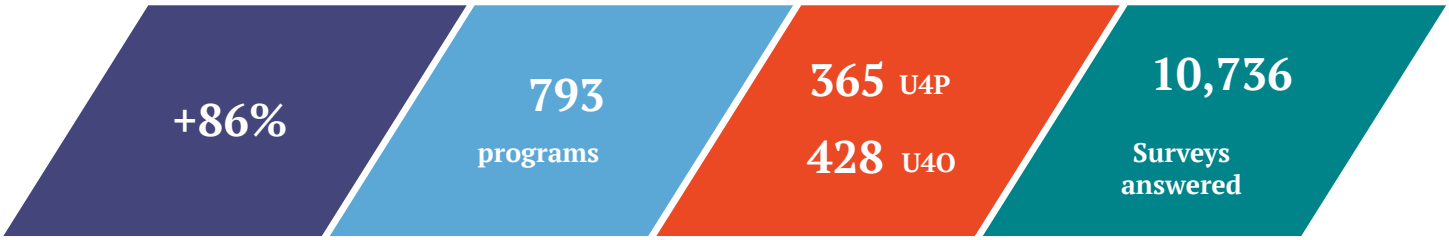
The application **cycle experiences** are as follows:

Prepare to apply	**Synchronous session of the expert** with the participants in small groups to go over the concepts learned, present the specific challenge of work application and the methodology to be used, session practice and answering questions.
Work application	The participant **applies the concepts learned to their work** according to the established challenge and reports the results obtained through the platform.
Competence evaluation	The teacher **assesses the work application**, using several key criteria. Four possible levels are assigned to each one: Not done, Insufficient, Sufficient, Excellent. The teacher also provides feedback for improvement. If the average evaluation is sufficient or higher it means that the participant already possesses the competency and that the results of value are already being applied to their work. If it is insufficient, they have a **second chance** to carry out the challenge by following the feedback provided and request an evaluation again.

NPS, the voice of the customer in real time.

As part of the customer focus strategy, tracking of NPS (Net Promoter Score) starting August 2020 was established as an indicator of the voice of our customers that enables us to provide memorable experiences.

The NPS is the experience measurement system most used by Fortune 500 companies and with the highest growth and impact worldwide.



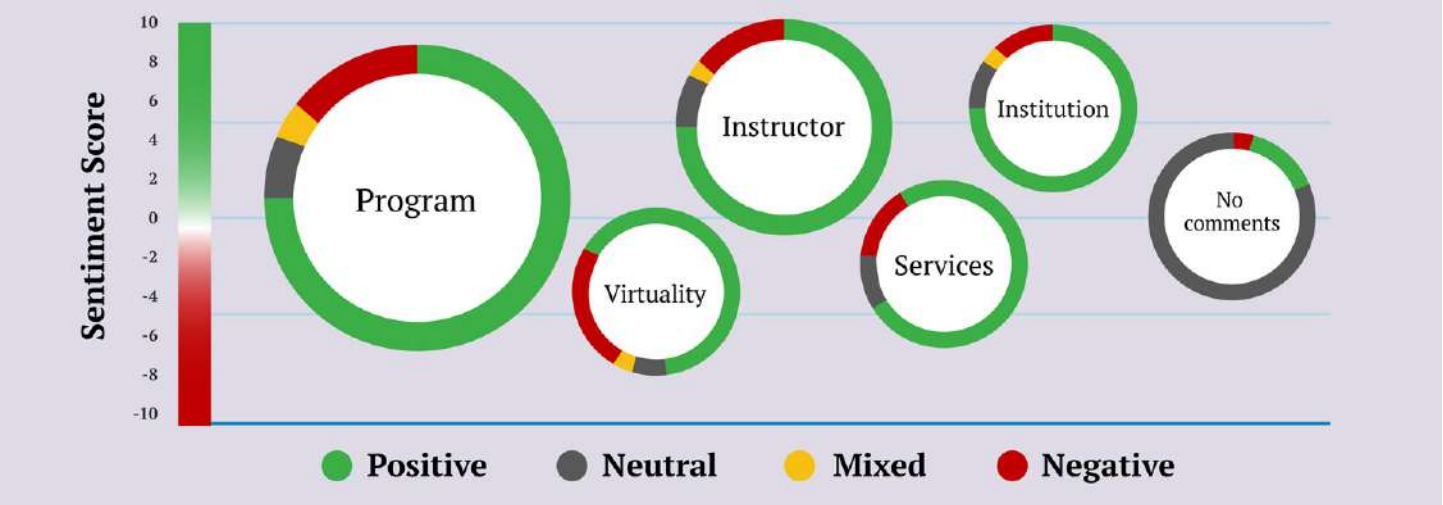
NPS July 2019 – June 2020 period. Vice-rectory of Continuous Education.

The benefits of implementing NPS are as follows:

1. **Implementation of Data Intelligence:** on April 2020, a leap was made in the measurement tool enabling the Qualtrics platform, based on listening to the customer in real time, which enables identifying detractors through instant alerts to react in a timely manner and be able to convert them into promoters before the end of the programs. In addition, it automates the data processing of our volumes, +600,000 comments opened annually.

2. **Improved experience:** thanks to this tool, the experience of our participants has been improved with an agile and proactive service, which has been reflected in the improvement of the NPS, going from +68% before using the tool to a current +86%.

3. **Sentiment analysis:** the analysis of texts and a predefined dictionary of categories (Program, Instructor, Services, Virtuality, Institution), enables us to know the feelings that move our participants and thus be able to act effectively and assertively.



Sentiment analysis, November 2020. Vice-rectory of Continuous Education

4 **Proactivity:** This platform and the data intelligence it provides has led to a greater degree of proactivity with all the areas that directly or indirectly intervene in the participant's experience, addressing best practices and a better understanding our audiences' needs.





III. Institutional initiatives beyond the health contingency

Tec21 Model. Innovations and advancements

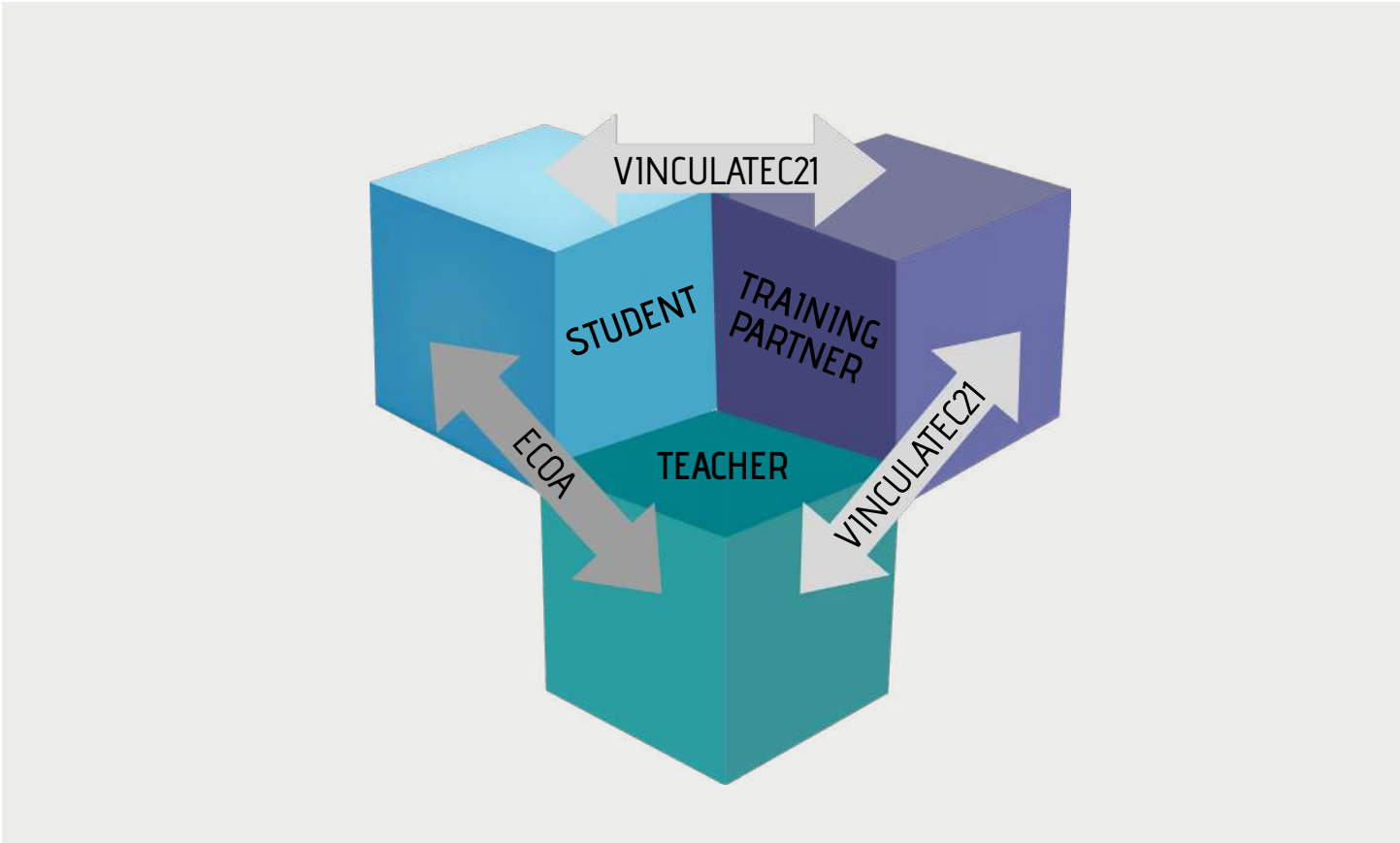
In 2020, the innovation and development strategy of the Tec21 Model continued with the purpose of promoting and enhancing the innovative capacities of our teachers for the development of students as active agents of change in a current, unprecedented context, in which the education is undergoing a complete transformation.

The innovations in the development of the Tec21 Model and the advances in the design of the 2019 Study Plans are presented below.

VinculaTec21: Blocks with a training partner at the Business School.

Linking plays a strategic role for challenge-based learning. The training partner is a key piece to pose problems that reflect the reality of the business, governmental and social spheres that connect learning with real environments. For the process of continuous improvement of the educational model, a feedback strategy was established for the link with training partners, through a project called **VinculaTec21**, where information is obtained through surveys.

The strategy includes the compilation of information from the three participating audiences: students, teachers and training partners:



The strategy features the collection of information from the three participating audiences: students, teachers and training partners.

The following table shows the aspects of the feedback survey.

Concept	Student	Teacher	Training partner
Contribution of the Training Partner to the students' learning	✓	✓	
Overall experience	✓	✓	✓
Comments (congratulations, complaints and suggestions)	✓	✓	✓
Interaction and challenge coordination		✓	✓
Satisfaction with student contributions			✓
Willingness to continue participating as a Training Partner			✓

In the August-December 2019 semester, the Business School began the integration of training partners to the exploration stage of the Block challenges, starting with Coppel as training partner and having, nationwide, 404 block groups, 95 training partners and a participation of 3,019 students and 241 teachers. As a result, 69% of the students and 72% of the teachers indicated that the challenge activities carried out with Coppel contributed greatly to the achievement of learning, and 63% of the students reported having an excellent experience.

Beginning with the February-June 2020 semester, the Business School collaborated with various training partners during the three periods of the semester, although due to the contingency caused by COVID-19, students in some campuses worked with Raw Cases in periods 2 and 3 of that semester.

The participation in the Blocks with challenges of the three periods was as follows:

Students	Teachers	Training partners
7,198	604	127

In general, 70% of the students and 80 % of the teachers indicated that the activities carried out with the training partner contributed greatly to the achievement of learning; 68% of the students indicated having an excellent experience with the training partner and 84 % of the teachers are very willing to continue collaborating with their training partner. The average response rates in the application of the questionnaire were as follows: students 11%, teachers 27%, and training partners 40%.

Tec Weeks.

Tec Weeks are Training Units that develop transversal and disciplinary competencies, which are grouped into four purposes that enable students to have complementary experiences of value. In order to teach them in the Flexible and Digital Model (FDM), the activities were redesigned and new dynamics were incorporated, where students were able to interact with training partners and students from universities in other countries, through virtual visits and work sessions.

In another design, national panels were held with internationally recognized experts in art, which enabled students to interact with them and learn more about code interpretation. The creativity of the designers and teachers was essential to ensure that the students had experiences of value that added to their development.

In the quantitative analysis of the study applied to the students, before and after the immersion, self-knowledge, collaboration, well-being and self-regulation are identified as the strongest competencies. Regarding the qualitative analysis, the most outstanding competencies were: self-knowledge, diversity, citizen commitment for social transformation, well-being and self-regulation.

Exploration blocks.

In the last semester of the exploration stage, students take an optional exploration block with sub competencies and contents from an educational area different from the one they are studying. The student can choose that Block from a varied offer of options. The evaluation results by the students who participated during this first wave were very positive.

Evaluation Pilot at the End of the Exploration Stage. Creative Studies Area.

The training programs of the Tec21 Model have three stages: exploration, focus and specialization.



Stages of the Curricular Plan in the Tec21 Educational Model and the evaluation moments at the end of each stage.

At the end of each stage a closing process is carried out, in which progress is evaluated, while the integration of learning is promoted, recognizing and providing feedback on student achievements.

In June 2020, the first students of the Tec21 Model in the Creative Studies Area completed their exploration stage, so a group of these students was invited to participate in a pilot of said closing process. The process was designed and implemented through situational techniques, such as the oral presentation of the portfolio and the competency interview. By creating a scenario similar to what happens in professional life, assessing the competencies in the area, such as integrated learning, was possible.

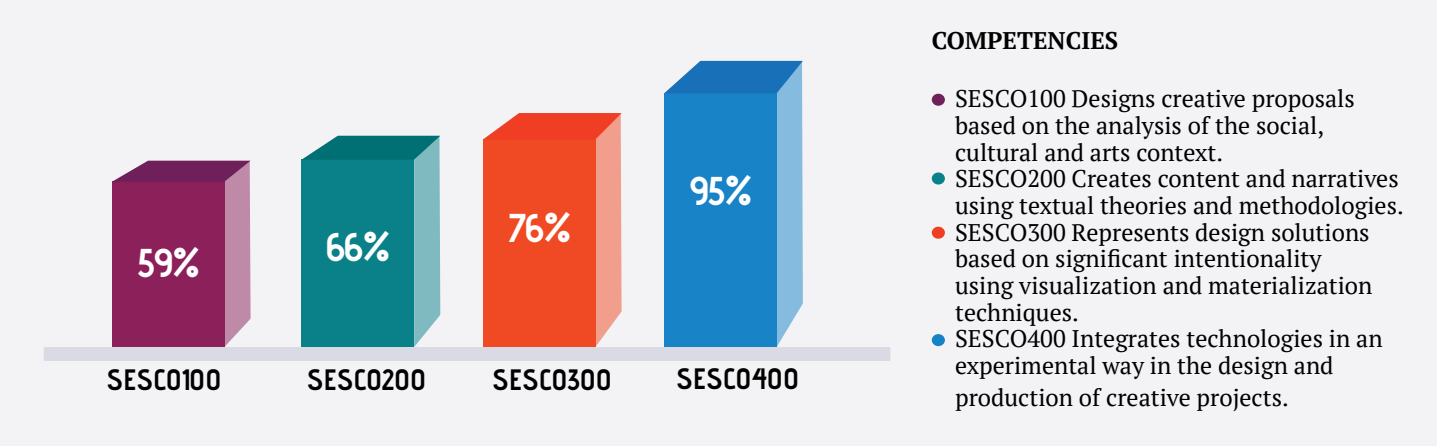
The pilot was carried out and 41 students participated in two sessions, Thursday 18 and Friday 19 of June 2020, between 9 a.m. and 6 p.m.; each individual session with students had a duration of approximately 30 minutes.

Teachers evaluated the students' performance associated with 4 competencies in the Creative Studies area:

- Designs creative proposals based on the analysis of the social, cultural and arts context.
- Creates content and narratives using textual theories and methodologies.
- Represents design solutions from a meaningful intentionality, using visualization techniques and materialization.
- Integrates technologies in an experimental way to the design and production of creative projects.

Competency achievement by students.

According to the results, students best demonstrated the competency related to the integration of technologies in an experimental way in the design and production of creative projects. On the other hand, the competency on the design of creative proposals was the one with the lowest percentage, since only 58 % of the students demonstrated it.



Percentages of students who reached the highest degree of achievement in all the indicators that correspond to the competency.

Students stated that this evaluation experience helped them to:

- Realize the interrelation of what they have learned during the exploration stage.
- Re-elaborate a portfolio that shows the best and most representative evidences of the area competencies, such as integrated and multidisciplinary learning.
- Analyze their strengths, opportunities and their potential for a new curricular stage.
- Have an experience comparable to that of a professional in the area when presenting their profile and their projects.

It should be noted that an assessment like this, at key moments in the curriculum, shows that students become aware of their competencies and integrate them into complex tasks.

The analysis of these results favored decision-making for the improvement of the curricular plan of the Stage of Exploration of Creative Studies.

Study Plans 2019.

To continue the 2019 Study Plans as an educational innovation based on the Tec21 Model, during the August-December 2019 semester and the current year, 326 Training Units were designed for the third and fourth semester, with the participation of 936 teachers from different Schools and programs.

Through design teams consisting of expert teachers at the national level who worked in a coordinated way and together with an extended team to advise regarding certain topics of greater specialty, each of the Schools carried out the process of designing the Training Units with timely monitoring of their teachers through feedback sessions. The design process involved, among others: training in the Tec21 model, participation in the design and transfer of Training Units workshops, as well as in the Academic Communities.

Given the context of the pandemic, timely monitoring of the process and troubleshooting was conducted using Zoom meetings, between the Academic Programs Department and the designing teachers, who also had the support of the Program Academic Affairs Team and the Area Academic Affairs Team.

Below is a breakdown of the number of Training Units designed by each of the Schools during August-December 2019 and 2020.

School	3rd. semester aug-dec-2019		4th. semester 2020	
	Training Units	Teachers	Training Units	Teachers
Social Sciences and Government	14	14	21	33
Humanities and Education	18	63	17	70
Engineering and Science	45	135	93	279
Architecture, Art and Design	19	45	16	41
Business	8	24	43	129
Medicine and Health Sciences	8	31	24	72

Digital education

This year has been one of great transformation for our institution and the role of Digital Education has been to coordinate work with the Schools to define the offer of courses and programs in digital modalities; and, based on this, offer our students courses and programs that incorporate didactic strategies and innovative technologies that enrich their learning process and educational experience, contributing to the digitization of education at Tecnológico de Monterrey.

During 2020, 32,190 High School and Undergraduate students were reached, as well as 9,403 graduate students (54% of the total graduate students at Tec de Monterrey); 5,252 continuous education students and 104,063 students from institutional programs, with the participation of 489 teachers.

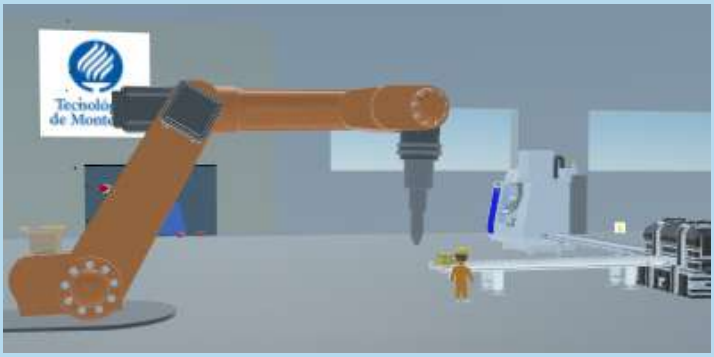
Additionally, thanks to the active work of 168 teachers, new learning experiences were incorporated with the use of advanced technologies and innovative teaching strategies, reaching over 7,629 students.

Strategy	Courses/Projects	Teachers reached	Students reached
Incorporation of personalized learning strategies and integration of adaptive learning technological tools.	2	2	192
Implementation of learning experiences using augmented reality, virtual reality and 360° video.	10*	10	878
Implementation of courses with the new graduate model.	14	14	1,597
Design of Training Units of general education, disciplinary and transversal sub competencies modules.	130	130	4,058
Dissemination of best educational practices in national and international forums.	4	2	128

*Only new resources designed in 2020 were included.

Description of projects of relevance.

Design and implementation of undergraduate courses using a virtual reality factory and simulators.



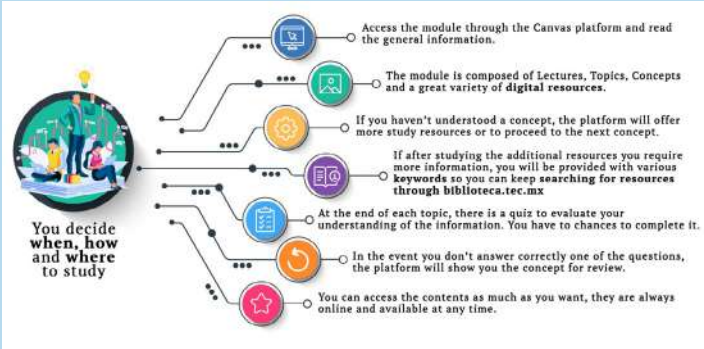
Derived from the impossibility of continuing the projects directly in production plants, the use of virtual reality factories was implemented in some undergraduate courses, accompanied by the use of simulators that enabled the student to enter the plant, collect information, develop the project and present proposals for improvement.

Design and delivery of the course "Statistical Thinking" with elements of Personalized Learning.



The course is designed to give students the opportunity to define their own learning path, and advance their understanding of content at their own pace. This enables them to prepare so the application of knowledge can take place during the sessions with the teacher. On the other hand, the teacher has analytics of the results obtained by students, which enables them to adjust each session according to the needs of the students.

Digital modules of transversal sub competencies..



The digital modules of transversal sub competencies are designed with the personalized learning strategy, they are flexible, provide appropriate learning paths for each student, and also give them the opportunity to advance at their own pace. These modules can be inserted in any Training Unit in which the development of a sub competency at a Proficiency A level is required.

Design and implementation of the Training Unit "Legality and Responsible Business" with Personalized Learning.

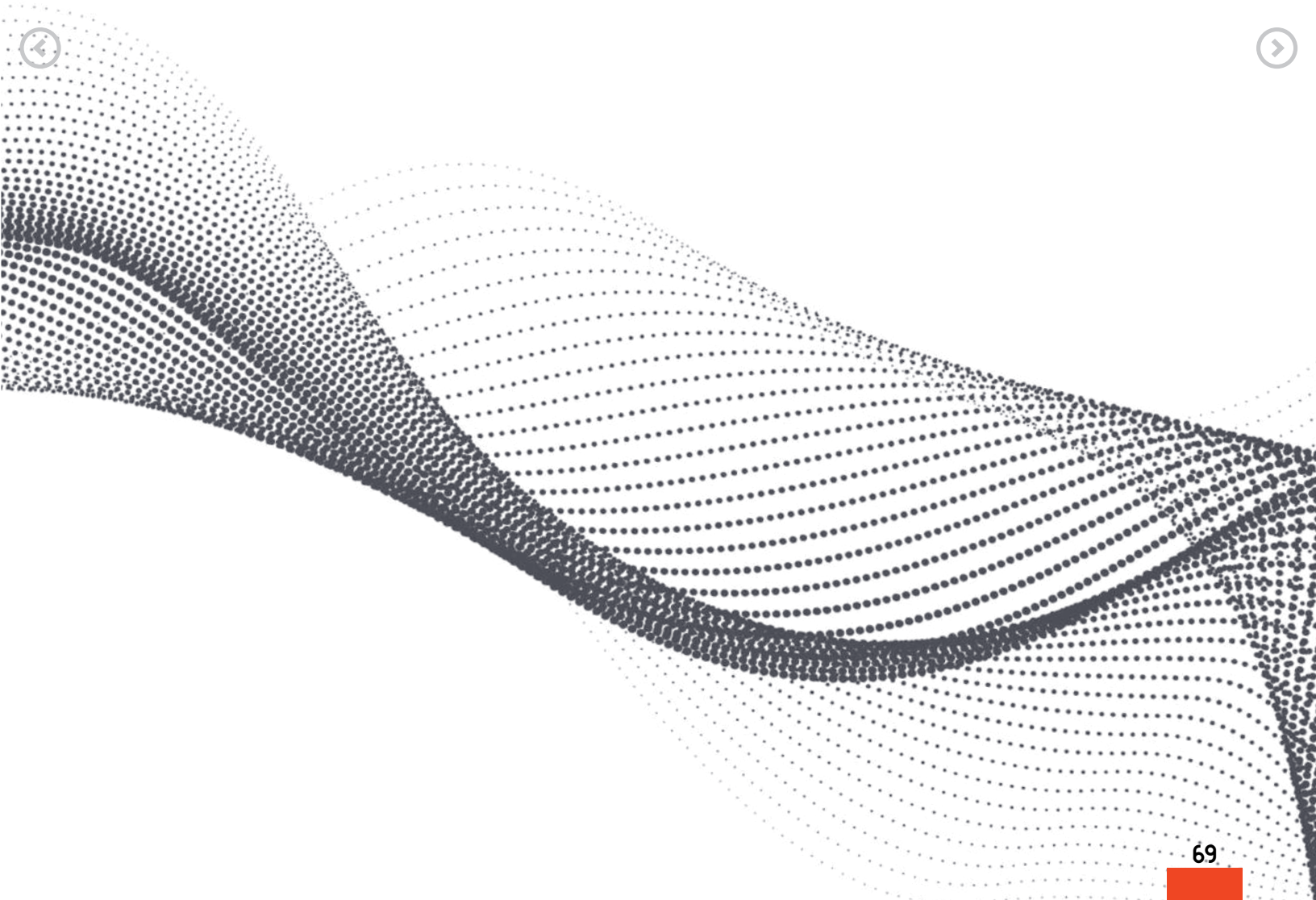


In the Training Unit "Legality and Responsible Business", through intervention scenarios and strategies, students access additional support resources such as videos, reading material and articles related to each topic to solve the problem situation presented by the course, reaching the proficiency levels of Culture of Legality, Responsible Business Management, Integrity and Ethical and Citizen Commitment.

Elite Model Courses.

The Elite model consists of a distance course where students learn directly from leading teachers and prominent national and international guests, enabling them to interact with colleagues from other campuses who are in RIC rooms (Remote Interaction Classrooms) via web conference sessions in real time. The groups are made up of 50 or more students to ensure rich interactions and personalized assistance by their teacher, in a digital learning environment that integrates content and activities.

During 2019, 26 RIC rooms were equipped on the different campuses to provide both teachers and students a digital space for communication and collaboration. In 2020, 6 courses were taught in these rooms, which accommodated 776 students, with the participation of 10 teachers.



Immersive learning with technology

During 2020, immersive learning experiences with technology were strengthened thanks to the development of various actions.

Among the projects the global challenge **"The future of storytelling with Augmented Reality"** stands out. Convened at the end of 2019 by Snap Inc (the company behind Snapchat), which together with Microsoft Research and the BBC R&D launched the Snap Creative AR Challenge, that challenged universities around the world to propose how to reinvent the future of storytelling.

The "I Love to Read Sci-Fi" project, proposed by a group of students and teachers from campus Querétaro, **was one of the 11 projects selected from the global call.** The program was created to promote reading, and it takes its users into stories with augmented reality. Readers who live this experience come across worlds based on iconic science fiction books such as "I Robot" by Isaac Asimov or "Fahrenheit 451" by Ray Bradbury. To learn more about the project, watch the following video: https://youtu.be/BYvMxf6Lows

Project advisory teachers:
- Luciana Subías Hernández

Project manager
- Eduardo Rosado Colmenares
- María Elena Melón Jareda
- Natalia Tyurkina

Student developers of the project:
- Casandra Yamile Garcia Cadeñanes
- Ivonne Helena Medina Vivas
- Paulina Leal Herrera
- Samantha Romero Castrejón
- José Francisco Laguna Tirado

Mentors
Bryan A. Smith – SNAPCHAT
Ana Gabriela Rodríguez Mendoza / Tecnológico de Monterrey
Innovación Educativa



Tec de Monterrey was the only Latin American university that participated in the event, competing with universities from the United States, Portugal, Canada, the United Kingdom, Spain, Israel and India. The projects selected in the Snap Creative AR Challenge had the opportunity to be presented virtually on June 17, within the framework of the international ACM IMX 2020 event, which addressed multimedia experience projects.

Other actions carried out were:

- **ILZT pilot:** Immersive Learning Zone with Technology located in Class Building 2 of Campus Monterrey, where immersive experiences were developed to reinforce the teaching-learning process through virtual reality resources or 360° videos. This made possible for both teachers and students to live enriching and memorable experiences for meaningful learning.
- **15 new resources** were integrated into the 360° video and virtual reality **immersive learning catalog,** and around 8 resources were updated as a result of continuous improvement findings, thus enabling a greater implementation of resources.
- The immersive learning catalog with technology was built for the **dissemination and implementation** to teachers of the institution.
- **360° video and virtual reality resources** were integrated for **digital immersive classes,** such as FIT and Digital Star.
- **Assessment instruments** were integrated into immersive classes with the aim of achieving continuous improvement.

This year, research and inquiries into immersive experiences were also carried out. Some of the results obtained are presented below.

- The immersive classes with the highest positive evaluation were those where the student experienced a high level of relationship between the **virtual reality** resource and the content and activity.
- Students expressed a greater understanding of the topics thanks to the visualization of the object of study, the feeling of being present or the possibility of "going to the place", the interactivity in the resource and the playful nature of the experience with the use of **360 video.**

On the other hand, during the August-December 2019 period, the virtual reality and 360° video resources used in the immersive classes were evaluated, obtaining the following results:

Resource	Students surveyed	Usability	Motivation	Perception of learning
Virtual reality 6 courses	246 students from 6 courses	86% of the students had a good experience regarding the usability of the technology.	86% of the students felt motivated by the activity.	88% of the students perceived that they learned better and that the use of VR helped them better understand the contents.
360° video	505 students from 11 courses	92% of the students had a good experience regarding the usability of the technology.	90% of the students felt motivated by the activity.	91% of the students perceived that they learned better and that the use of VR helped them better understand the contents.

The following are the stats of the initiative recorded during the August 2019-December 2020 period.

Students	Subjects	Campuses	Teachers
16,466	126	26	286

Results recorded from August 2018, when this initiative was implemented, to date.

Students	Subjects	Campuses	Teachers
21,760	223	26	442

Personalized learning



New implementation of personalized learning with adaptive bases.

Given the favorable results obtained in the evaluation of the model of the leveling courses for Biology and Chemistry, which used the strategy of **personalized learning with adaptive bases**, the **high school rectory of campus Garza Sada** decided to offer these courses in January 2020 as a topic for students with an interest in the Health Science programs.

The **Continuous Education** area also decided to offer these courses on July to students who come from high schools outside the Tecnológico de Monterrey community to Health Sciences programs, as well as for any national or international student who wishes to level up in their knowledge.

Applications of the Personalized Learning initiative with adaptive bases.

The **personalized learning with adaptive bases** strategy was used for:

- **Knowledge leveling** in basic sciences (mathematics, biology and chemistry).
- The **development of the transversal sub competency of Written language** levels A and B within the Gender, Society and Human Rights Training Unit.
- Increasing the **academic performance** of students within the Training Units:
 - Statistical thinking
 - Legality and responsible business.
- Support **the implementation of active learning**, flexible learning and flipped classroom strategies.

This year, research and inquiries were also carried out regarding the implementation of the strategy. Below are some of the findings.

- Students rate the use of **personalized learning with adaptive bases as relevant**, since they feel better prepared when crafting their learning evidences.
- Most of the students obtained a **passing grade** in the subjects where the strategy was implemented.
- In courses where the knowledge leveling strategy was applied, there was an **increase in the grade average** in all the campuses where it was implemented.
- Students consider it useful for their academic performance to have **different study resources** at all times during their learning process.
- Students indicate that the use of **personalized learning with adaptive bases** enables them to reflect on their understanding of the content and academic performance.

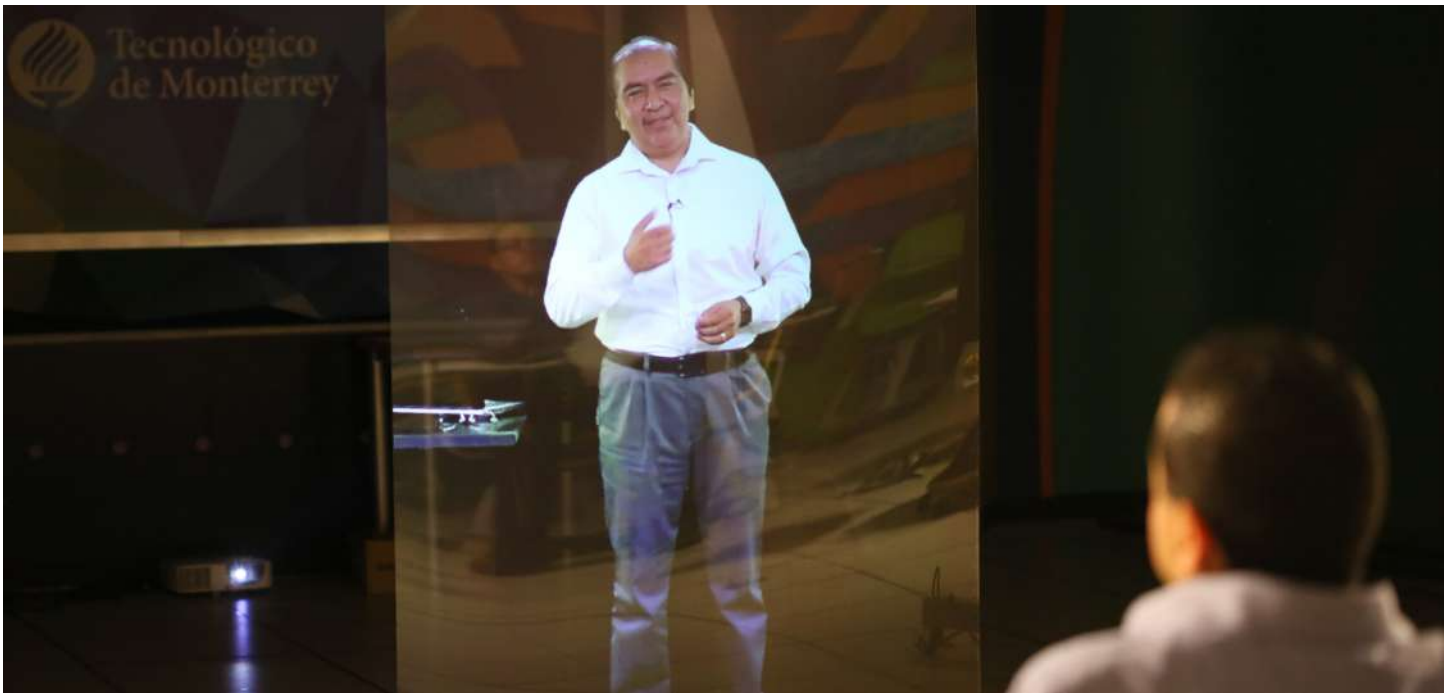
The following are the stats of the initiative recorded during the August 2019-December 2020 period.

Students	Subjects	Campuses	Teachers
2,763	62	24	406

Results recorded from August 2018, when this initiative was implemented, to date.

Students	Subjects	Campuses	Teachers
6,923	67	24	511

Holographic telepresence



The experience of **Holographic telepresence** during 2020 was consolidated within the Tecnológico de Monterrey through:

- The technological update of the Telepresence 2.0 receiving and transmitting rooms, where the audio and video experience was more immersive.
- The inauguration of **5 new receiving campuses:** Ciudad de México, Estado de Mexico, Santa Fe, Querétaro and Guadalajara, and **a new transmitter campus:** Santa Fe.
- The incorporation of the School of Medicine and Health Sciences and the increase in the educational offer of the Engineering, Business, and Architecture Schools.
- The integration of new experiences such as team teaching with Professor Diana Young from Trinity University, an expert in Business Analytics in the field of Financial Scheduling and Modeling.



Results of research comparing Holographic Telepresence to face-to-face classes.

- **Academic performance and Engagement:** There is no significant difference between the control groups and the groups taught using telepresence.
- **Social presence:** Evidencia de alta valoración.
- **Benefits:**
 - Maintaining the natural dynamics of a face-to-face class.
 - Humanizing the distance educational experience.
 - Creating a state of flow (curiosity, concentration, enjoyment and challenge).
- The students rate the **experience as innovative**, interesting and different because they perceive that the teacher is present before them.
- **What they value the most is the didactics of the class,** the access to the different experts in the field, the intercampus interaction and the use of technological tools that enable them a more personalized attention, despite he distance.

The following are the stats of the initiative recorded during the August 2019-December 2020 period.

Students	Subjects	Campuses	Teachers
1,668	34	11	53

Results recorded from 2018, when this initiative was implemented, to date.

Students	Subjects	Campuses	Teachers
2,502	41	11	70

SEMESTRE i

Since 2016, i-Semester has been a precursor of the Tec21 Model and has enabled the institution to learn and improve the characteristics of a model based on competencies and challenge-based learning. As an experiential Educational Model, it promotes the involvement of students with their environment through a relevant challenge that helps solve a real problem linked through a training partner. Solving this challenge seeks the development of disciplinary and transversal competencies.

As a result of the pandemic generated by COVID-19, this fundamental characteristic of the model was threatened and, for a moment, the possibility of suspending the educational offer was considered. However, thanks to the enthusiasm and creativity of the teaching team, in collaboration with their training partners, they made adjustments in the approach to the challenge and generated innovative practices that enabled them to complete semester activities and meet the initial objective: to develop in students the disciplinary and transversal competencies declared in their i-Semester.

This situation made us to realize that, although the interaction with the environment and with the socio-educators is not the same, by working virtually objectives can be achieved and possibilities can be opened to learn to interact and overcome obstacles that arise with the new reality, which has brought ways of working never seen before, and that in many cases are here to stay.

The health contingency has given our teachers and students the possibility to be protagonists of these new ways of working and to expand possibilities of interactions through the digital world.

Teachers have generated alternative and innovative ways to keep the challenge alive. Some examples of this are:

Million molecules in coffee and milk



Biotechnology Engineering students had the possibility of visiting milk and coffee producers directly at the farms and the plant, but they continued their "laboratory" practices from home. The students received a kit of materials provided by the institution and the training partner, as well as virtual guidance from their teachers to carry out the experimental part. If the health contingency continues, a virtual tour of the farms and coffee plant is being considered for next year.

Analysis and supply of materials



For this i-Semester in Campus Toluca, students worked with an automotive company. As part of the adaptation of the activities and practices, meetings were conducted using Zoom with the training partner so that the students could present their proposals and receive direct feedback from the company. They also were closely monitored by the teachers and had access to the modules taught virtually.
In addition to the knowledge learning part, the students had the opportunity to visualize the impact of their proposals and developed communication skills that motivated them to achieve satisfactory results in solving the challenge.

Focus on social innovation



Direct work with various communities in the state of Chiapas continued, as students had done for several semesters. With a new attitude towards the situation, the community organized to have interaction through “ambassadors” trained by the Institution in the use of technological tools to be spokespersons for their communities. In this context, students realized that from home, value can be generated and positively affect the lives of other people, and knowledge can be shared equally and in both directions

Automotive embedded technology



Thanks to the collaboration between teachers and the international training partner National Instruments, students were able to implement a drone's control subsystem, which is part of a system that generates renewable energy, using “GG-Awes” technology. The students implemented a “processor of the loop” assembly to validate the embedded software corresponding to the control algorithm. The training partner made a donation of electronic kits for each of the students and teachers sent them to their homes. In addition, Matlab libraries (Simulink aerospace blockset) were incorporated for greater remote monitoring and support during the undertaking of the challenge.

As part of the pilot programs that were carried out in the institution to return in a staggered way to campus, in Campus Guadalajara the implementation in hybrid format of one of the i-Semesters was carried out during the August-December 2020 period.



The i-Semester "Kaizen" scheme considered that the module sessions would continue to be virtual and the face-to-face aspect was limited to students visiting the plant with the training partner. This made it possible to test and document protocols that will be very useful to give continuity to our Tec21 Educational Model.

All these experiences led to the conclusion that, with the support of technology, there are alternative ways to continue the model. During the August-December 2020 period, the i-Semester was maintained, despite the fact that it was expected, from the beginning, that there would be no possibility of returning to a face-to-face environment. This scheme is expected to continue in future semesters.

The challenge lies in that, despite the distance, a constant and close collaboration be reached between the three pillars of this model: students, teachers and training partners, and thus achieve satisfactory proposals and results, resulting in significant learning for all parties.

Lastly, with the participation of 1,038 teachers and 3,337 students from the different campuses, i-Semester developed 174 projects in the August-December 2019 period and the two periods of 2020, registering the following stats by region and Schools.

August-December 2019

Region	i-Semesters	*Teachers participating	Students reached	Schools	i-Semesters	*Teachers participating	Students reached
Mexico City	7		115	Architecture, Art and Design	13		197
Center	9		176	Social Sciences and Government	5		75
Norte	20	401	320	Humanities and Education	3	401	36
North	21		475	Engineering and Science	30		559
West	16		235	Business	22		454

*Teachers who participated in more than one i-Semester are included, either from the same period or different periods.

January-December 2020

Region	i-Semesters	*Teachers participating	Students reached	Schools	i-Semesters	*Teachers participating	Students reached
Mexico City	13		225	Architecture, Art and Design	8		154
Center	12		256	Social Sciences and Government	6		95
North	19	637	332	Humanities and Education	3	637	46
West	37		903	Engineering and Science	28		545
South	20		300	Business	56		1,176

*Teachers who participated in more than one i-Semester are included, either from the same period or different periods.

With the design of 1,239 challenging and innovative activities, 32 of them with an international focus, and the participation of 2,358 teachers, **i-Week** registered the participation of 36,978 students from across campuses during the August-December 2019 semester.

Of the 2,358 participating teachers, 1,196 served as designers, 1,119 as co-authors, and 43 supported the class teachers in implementing the activity.

Below are the stats for i-Week during the **August - December 2019 period.**

Activities	Teachers participating	Students reached
1,239	2,358	36,978

Participation by topics covered by the activities.

Activity topics	Teachers participating	Students reached
Experiential Session Workshop	1,179	18,791
Research activity	299	3,605
Community Experience	228	3,558
Activities co-designed with students	201	3,431
Vertical Workshop	186	2,972
National activities	177	2,668
Certification	88	1,953

Participation by region.

Region	Activities	Teachers participating	Students reached
North	419	823	12,606
Mexico City	235	425	7,701
Center	190	401	5,953
West	217	358	5,852
South	178	351	4,866

On the other hand, as an element of the 2019 Study Plans, **Tec Week**, a Training Unit aimed at developing competencies within and outside the discipline, registered in 2020 a participation of 2,673 teachers as designers, advisors and mentors, who accompanied over 60,000 students from different campuses enrolled in one or more of the different activities.

The conditions generated because of the health contingency caused, in the February-June semester, the cancellation of Tec Weeks 6 and 12, giving way to the training of teachers in topics related to didactic planning and preparation of synchronous and asynchronous elements for the digital delivery of Week 18 through the Flexible and Digital Model with the participation of 281 teachers, 173 advisors and 48 mentors, reaching 7,196 students from all campuses.



This week became relevant in the academic continuity by offering students a space for reflection in emotional and academic aspects. In retrospect, they were able to evaluate their performance during the continuity and, prospectively, assess the relationship of the new learnings with the reality they faced.

Next, the impact purposes of Week 18 on the training of students are presented.

1. Guide the training by reflecting on the results of the semester, the goal being to establish commitments to improvement.
2. Offer training alternatives to reinforce mastery of areas of knowledge required by students.
3. Promote the development of skills through activities of communication, self-awareness and management.
4. Strengthen the disciplinary identity of students and their integration with the student community: through group sessions with peers and interaction with their success mentor and academic advisor.

For the 2020 summer period, only the Social Service Induction Week was held, which was conducted using the Flexible and Digital Model, with the participation of 6,130 students and 166 teachers. For the August-December semester, the design of 47 activities for the digital delivery of Weeks 6, 12 and 18 was transformed. During this period, 2,005 teachers and over 49,000 students from different campuses participated.

Below are the stats for Tec Week during **January - December 2020.**

Activties	Teachers participating	Students reached
1,745	2,673	62,590

***At the end of this edition, the statistics for Week 18 in the August-December 2020 semester were not yet available.**

Participation per Tec Weeks.

TEC Weeks	Teachers participating	Students reached
Week 18 (February-June)	502	7,196
Social Service Induction Week	166	6,310
Week 6 (August-December)	933	24,402
Week 12 (August-December)	1,072	24,862

NOVUS

NOVUS is a Tecnológico de Monterrey initiative that seeks to strengthen teacher's culture of evidence-based innovation with the purpose of promoting research in educational innovation for the professional development of the faculty, the continuous improvement of their teaching practice and to build the future of education.

Through its call, NOVUS provides funds and methodological support for the implementation of educational innovations and the measurement of their impact, and promotes the dissemination, transfer and scaling up of innovation projects, as well as their internationalization through peer-reviewed publications, conferences and international competitions.

The operation of the projects was affected during the pandemic caused by COVID-19. Despite the challenges, NOVUS continues to support educational innovation projects that build the future of education.

Experimentation and impact measurement in educational innovation.

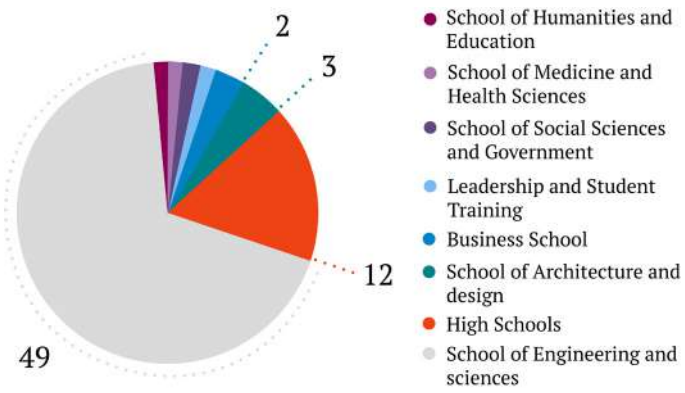
For the 2020 edition of the call:

1. A new Evaluation Committee body was formed, which included collaborators from the institution, as well as national and international guests.
2. The registration of proposals format was updated, favoring those that supported their methods with evidence from scientific journals.
3. Of the 347 proposals received, 70 projects were selected to begin in January 2021. 255 teachers are involved in these projects.

- All the projects supported by NOVUS committed to measure the impact the proposed innovation has on the learning or development of the institution's students.
- 33 of the approved projects made the commitment to share their results in a Scopus indexed international conference.
- 24 of the approved projects accepted to share their results in a scientific journal indexed in the first two quartiles of the Scopus database.

Below are some stats of the NOVUS 2020 call.

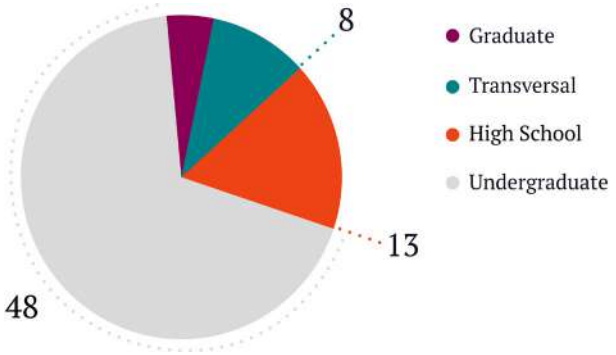
Distribution of projects by School.



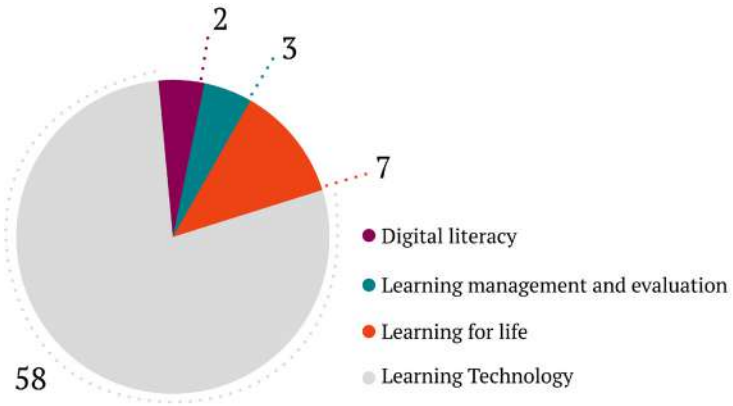
Distribution of projects by region.



Distribution of projects by educational level.



Distribution of projects by thematic line.



Another achievement obtained during 2020 was sharing the results of the NOVUS 2018 projects in international and prestigious forums:

89 **scientific publications** of which:

- **48** were published in various national and international spaces
- **41** were published in journals and conferences indexed in the Scopus and/or World of Science databases.

13 **appearances** in various means of dissemination and/or communication.

NOVUS Tríada

In coordination with La Tríada universities, during 2019 the first NOVUS La Tríada Fund call was launched. 208 individual proposals participated in the call. In the second phase, 23 teams were formed, where at least 66 teachers from the three universities presented a final proposal.



Some of the projects chosen to receive funds for $30,000.00 USD to be carried out for 18 months, starting in January 2020, are presented below.

Don't forget yourself, don't forget me.

The project consists of developing a virtual portfolio, in the form of an app that enables the integration in a systematic and oriented way of the experiences of the students with their teachers, patients, health teams and local communities to benefit the development of professional identity and professionalism. The smart app helps students in the transitions to different moments of professional identity and professional practice in clinical settings.

Lead teachers: Silvia Olivares from Tecnológico de Monterrey, Mexico. Natalia Mejia from Universidad de Los Andes, Colombia and Klaus Puschel from Pontificia Universidad Católica de Chile.

Implementation of extended realities as an engagement strategy to connect content and disciplinary competencies with the work environment.

The purpose of the project is for the student to develop a connection between knowledge and their profession in the current environment. It was considered necessary to motivate commitment (engagement) through real and experiential content, with the use of extended realities technology..

Lead teachers: María Ileana Ruíz from Tecnológico de Monterrey, Mexico. Luis Pinzón from Universidad de Los Andes, Colombia and Claudio Mourgues Álvarez from Pontificia Universidad Católica de Chile.

Without a doubt, 2020 was a year of learning for everyone and CEDDIE continued to offer teachers not only training tools, but also useful resources to face the challenges of the COVID-19 pandemic.

During this year, CEDDIE offered spaces for the rapid dissemination of best practices and to facilitate access to visual resources that can be consulted in a very short time. Since the innovation process begins with the teacher in their day-to-day practice, we quickly moved to the digital space, where we found new ways of interaction and accompaniment for teachers.

Some of these dissemination spaces are described next.

Resources and quick help on the CEDDIE.



Video resources and quick guides have been shared on the CEDDIE page http://ceddie.tec.mx to help answer frequent questions of teachers during the period of adaptation to the digital model, and for the next steps in the hybrid model. The page offers SOS and Emotional Health spaces, the latter integrated in coordination with LiFE.

Space for the exchange of innovative experiences and best practices.

To promote the exchange of good experiences, the "Flexible and Digital Model" space was created in Workplace. Using short videos, easily adaptable innovative practices are shared on how to evaluate, how to interact, how to motivate, etc., connecting teachers and accelerating learning in a space where knowledge is socialized. The network has over 5,600 members and records of up to 500 views this year.

One of the lessons that this experience of the Flexible and Digital Model has left us is that we can achieve innovations in our courses through sharing what works and what doesn't.

Promoting the participation of teachers in institutional initiatives.

As part of the efforts to promote the participation of teachers in calls for Educational Innovation such as NOVUS and the International Conference on Educational Innovation, the following actions were carried out:

- Preparation for calls: 22 sessions with the participation of 216 teachers.
- A networking session as a meeting space for teachers with the desire to join teams to participate in innovation projects.
- In the 2019 call, 131 projects were accepted and in the 2020 call, 70 projects.

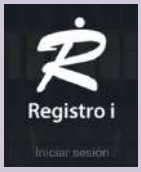


Activities to promote educational innovation in the classroom.

We continue with our program of talks, demos and workshops with the purpose of publicizing news in educational technology, teaching strategies and well-being in the classroom. The talks were given, mainly, by teachers and experts on different topics. This year 406 activities were carried out that reached 3,502 teachers.

As part of the projects and experimentation initiatives to promote educational innovation in the classroom, virtual reality activities were carried out, in which 579 teachers participated, while 589 teachers participated in various experiments.

Registry of educational innovation.



Last November, a site was launched to document educational innovation initiatives, from innovative practices in the classroom to funded projects.

Through a form that guides teachers in the documentation of their initiatives, information on what is being done in the institution is obtained. It is expected that this tool will enable documentation for the teachers' classification process and having integrated information that facilitates the participation of teachers in forums and conferences.

The site is open to all teachers from Tecnológico de Monterrey.

observatory
of Educational Innovation

The Observatory of Educational Innovation is the prospective and institutional learning unit dedicated to promoting and fostering the development of educational innovations through the analysis and dissemination of trends and experiences with the greatest impact in high school, undergraduate and graduate education.

Impact during the July 2019 - August 2020 period.

- 4 million visits to the web pages: observatorio.tec.mx and observartory.tec.mx.
- 213,000 subscribers to the Weekly Report.
- 500,000 followers in social networks.
- Transmission of 11 **webinars** with 450,000 minutes viewed.
- Transmission of 5 web dialogues in collaboration with Pontificia Universidad Católica del Perú and Universitat Oberta de Catalunya with 100,000 minutes viewed.
- Publication of 451 articles and Edu News notes.
- Publication of 116 Edu bits reports.
- 46 weekly reports sent.
- 18 Podcasts TECSOUNDS - EDUTRENDS.
- Web pages were created with educational resources for teachers, administrators and students to face the COVID-19 contingency, in Spanish and English.
- An invitation was received to take part in two calls for projects funded by the European Union:
 - COST Action Proposal Developing critical agency in the era of disinformation through interdisciplinary educational initiatives - Invitation from University of Crete (Greece).







IV. Educational Innovation Awards

QS Reimagine Education 2019 projects

QS Reimagine Education 2019.

With the objective of promoting innovative projects in the institution, in 2019 NOVUS offered support to 20 projects with the development of their proposal for the Quacquarelli Symonds' (QS) Reimagine Education contest.

Out of 1,500 international proposals, 10 proposals developed by teachers from the institution were finalists. In the 2019 edition, the NOVUS project "Early development of technical skills in introductory courses for careers in the Advanced Manufacturing area", led by teacher Vianney Lara Prieto, received the Silver recognition in two categories: Regional Latin America and Discipline Engineering & IT.



Early development of technical skills in introductory courses for careers in the Advanced Manufacturing area

Professor
Vianney Lara Prieto
IMT Program Director
Campus Monterrey

2nd place
Category
Latin American Award

2nd place
Category
Engineering and IT Award

Below are the **shortlisted proposals** for the QS Reimagine Education **2019.**

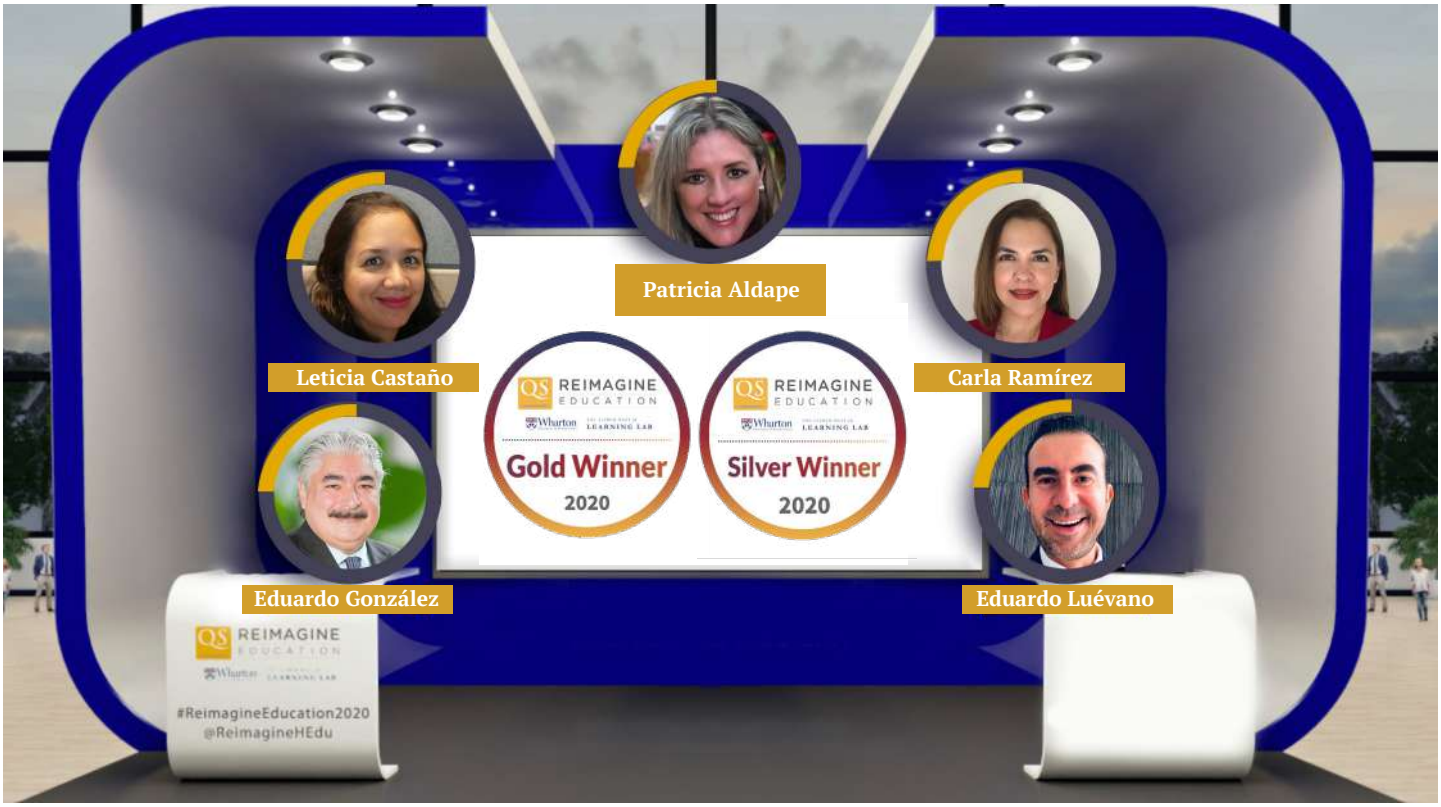
Participants	Campus	Project	Category
Vianney Lara Prieto	Monterrey	Hands-on experience with Star Wars Robotics (NOVUS).	*Latin American Award *Engineering and
Araceli Florido Segoviano	Querétaro	Creating a Game Application for Learning the Organic Compound Nomenclature. Second Stage and Measure of its Effectiveness (NOVUS).	Education App Award
Aldo Raúl Murillo Zúñiga	Querétaro	Virtual Reality learning environment for immersive teaching of design principles and visual communication (NOVUS).	Virtual/ Augmented Reality Award
Damien Jean Philippe	Obregón	News betting BlockChain plateform: improving foreign language understanding by connecting class content to world news (NOVUS).	K12 Award
Pedro Ponce Cruz	Ciudad de México	Robotic Platform for Teaching Mathematics and Robotics in Primary School One Student at a Time.	K12 Award

Participants	Campus	Project	Category
Roberto Pablo Martínez	Puebla	Reducing anxiety and stress for math exams by applying Heart Math.	K12 Award
Rocío Hernández Larriba	Querétaro	Activist Architecture designed from Empathy.	Sustainability Award
Román Pouzou	Querétaro	Entrepreneurs since primary school.	K12 Award
Yasmany Mancilla Méndez	Monterrey	Education for Sustainability: Creating Today's Change Agents.	Sustainability Award
Bertha Saldivar e Irving Hidrogo	Monterrey	Mostla - Emerging Educational Technologies.	Cultivating Curiosity Award

QS Reimagine Education 2020.

In the 2020 edition of QS Reimagine Education, **the project "Hologram professors humanize and bring accessibility to the distance education experience" received the Gold Winner: People's Choice Award and the Silver Winner: ICT Tools for Learning and Teaching Award.**

The winning team of this award is made up of Patricia Aldape, Carla Ramírez and Leticia Castaño from the Department of Educational Innovation of the Vice-rectory for Academic Affairs and Innovational Education, and teachers Eduardo Luévano and Eduardo González Mendívil from the School of Engineering and Sciences.



The **"Week 18. Stop to move forward" project was the winner of the Bronze Award** in the Learning Assessment Award category. The winning team of this award is made up of Francisco Ayala Aguirre, Juan Carlos Enriquez Gutiérrez, Claudia Zubieta Ramírez, Sergio Andrés García Medrano and María Gisela Cante Reyes from the Academic Programs Department of the Vice-rectory for Academic Affairs and Innovational.



The event was held in digital format, with 1,425 participating projects in the different categories, representing 70 countries.

Participants	Campus	Project	Category
Ana Yael Vanoye y Héctor Eder Carrera	Monterrey	Making Biodiesel in Virtual Reality	Virtual/Augmented Reality Award
Manuel E. Macías	Monterrey	Remote, Cyber-Physical and Virtual Training Platforms	E-Learning Award
Francisco Delgado	Estado de México	Tangle: an educative suite to boost interest and learning of undergraduate students in quantum information	Hybrid Learning Award
Patricia Aldape Valdés Carla Ramírez López Leticia Castaño Sánchez Eduardo Luévano Belmonte Eduardo González Mendivil	Monterrey	Hologram professors humanize and bring accessibility to the distance education experience	ICT Tools for Learning and Teaching Award
Francisco Ayala Aguirre Juan Carlos Enriquez Gutiérrez Claudia Zubieta Ramírez Sergio Andrés García Medrano	Monterrey	Semana 18. Stop to move forward	Learning Assessment Award

These are some of other international awards received during 2020:

CHEA Council for Higher Education Accreditation
CHEA International Quality Group CIQG

Tecnológico de Monterrey was recognized by the Council of Higher Education Accreditation (CHEA) as a **winner of the 2019 CIQG Quality Award**. This distinction recognizes the outstanding performance of higher education institutions, in compliance with the international quality principles of the CIQG (CHEA International Quality Group).



CHEA is made up of a group of experts and leaders in higher education and is the only private sector organization in the United States focused exclusively on higher education accreditation and quality assurance. Over 550 institutions that accredit academic quality in more than 170 countries are endorsed by CHEA. Its members include Harvard University, Stanford University, Babson College, and Texas A&M University.

Dr. Joaquín Guerra Achem, Vice-Rector for Academic Affairs and Innovational Education, Beatriz Palacios, Director of Educational Innovation and Maribell Reyes, Director of Digital Education, received the award on behalf of Tecnológico de Monterrey on January 30, 2020, in the context of the CHEA annual meeting in Washington, DC



APeL Asociación de Proveedores de e-Learning

At the International Congress of e-Learning - ApeL 2020, the Association of e-Learning Providers **awarded Continuous Digital Education, from the Department of Educational Innovation, the APeL Award for Excellence in e-Learning in the category of "Best e-Learning solution in the education sector."**

This distinction recognizes the outstanding performance of the programs that make up the digital educational offer aimed at the working adult sector. The award was received on February 7 by Noemí Villarreal, Director of Continuous Digital Education, during the International Congress of e-Learning held by the Spanish Confederation of Business Organizations, in Madrid.

Finalist project.

FALLING WALLS

The project “Breaking the wall to revolutionize education at Tecnológico de Monterrey”, presented by Dr. Maribell Reyes and Dr. Joaquín Guerra, from the Vice-Rector's Office for Academic Affairs and Educational Innovation at Tecnológico de Monterrey, was selected as one of the finalists of the Falling Walls Conference, out of more than 900 nominations from 111 countries.



The project addresses the issue of the Tec21 Model as innovative thinking, which was the thematic focus of the scientific advances of this year's edition, held last November in Berlin, Germany. Falling Walls Conference is an annual scientific event, showcasing the research work of international scientists from a wide variety of fields.

NOVUS

During the NOVUS 2019 National Convention, teachers from the Tec community were recognized for their outstanding work in educational innovation projects and scientific production.



In the category of scientific production, in the list of publications registered with WL and with publications in a journal indexed in the first two quartiles of Scopus, the recognized professors were:

- **Claudia Lizette Garay Rondero.**
 Campus Puebla.
 Experiential Learning at Lean-Thinking-Learning Space
 Journal on Interactive Design and Manufacturing (IJIDeM), Q2
- **Elizabeth Toriz.**
 Campus Estado de México.
 Learning Based on Flipped Classroom with Just-in-Time Teaching, Unity 3D, Gamification and Educational Spaces
 Journal on Interactive Design and Manufacturing (IJIDeM), Q2
- **Luis Vargas Mendoza.**
 Campus Estado de México.
 A learning environment to stimulate the development of competencies for mechanical design
 Global Journal of Engineering Education, Q2
- **René Joaquín Díaz Martínez.**
 Campus Laguna.
 Design and implementation of a semester i for mechatronic engineering
 Journal on Interactive Design and Manufacturing (IJIDeM), Q2



In the category of scientific production presented in a congress indexed in Scopus, the recognized professors were:

- **Martha Elena Núñez López.**
 Campus Puebla.
 Real-time distance courses to improve satisfaction and competence: a case study on the performance of students observing their grades
 IEEE EDUCON - Global Engineering Education 2019
 International Mechanical Engineering Congress & Exposition 2018 (IMECE 2018)
- **Miguel Xicotencatl Rodríguez Paz.**
 Campus Puebla.
 The i-Semester Experience: Undergraduate Challenge-Based Learning within the Automotive Industry
 IEEE EDUCON - Global Engineering Education 2019
 “Measuring the Developing of competences with collaborative interdisciplinary work”
 IEEE EDUCON - Global Engineering Education 2019



Recognized teachers, whose project was entered and selected as a finalist (shortlisted) or as a winner for the Reimagine Education Awards 2019.

- **Aldo Raúl Murillo Zúñiga.**
 Campus Querétaro.
 Virtual Reality learning environment for immersive teaching of design principles and visual communication.

- **Araceli Florido Segoviano.**
 Campus Querétaro.
 Creating a Game Application for Learning the Organic Compound Nomenclature. Second Stage and Measure of its Effectiveness

- **Damien Jean Phillipe Lesca.**
 Campus Obregón.
 News betting BlockChain platform: improving foreign language understanding by connecting class content to world news



- **Vianney Lara Prieto.**
 Campus Monterrey.
 Hands-on experience with Star Wars Robotics
 Silver Award winning project, QS Reimagine Education 2019

SEMANA i

Due to the design and performance of the disciplinary, multidisciplinary and challenging learning activities implemented in the August-December 2019 semester, i-Week recognized 138 teachers from different campuses, as the best evaluated in their teaching practice.

Campus Aquascalientes
Patricia Margarita Reynaga Alcalá.

Campus Chiapas
Juan Carlos Alfonzo León.

Campus Ciudad de México
Rosa María Guadalupe García Castelán.
Cynthia Livier Toledo Polis.
Luis Manuel González de Salceda Ruiz.
María de la Luz Eloisa Ascanio Rivera.
Olga López Ríos.
Alicia Isabel Rodriguez Ruiz Velasco.
Jorge Alfonso González González.
Luis Ernesto Macías Ruiz.
María Elena Reyes Cisneros.
Miguel Angel Gil Robles.
Luis Arturo Bernal Ponce.
Mario Isidro De la Fuente Martínez.
Edgar Rogelio Ramírez Solís.
David Rebollo Catalán.
Anakaren Góngora Hernández.
Alicia Caldera Quiroz.
Alba Patricia Cárdenas López.
Dulce María Aquino Chacón.
Julia Astengo Noguez.
Javier Medina Aguilar.
Araceli Castelán López.
Arturo Alberto Hernández Medina.
Laura Marcela Morales Hernández.
Mauro Rodríguez Marín.

Campus Hidalgo
Luis Iván Bautista Lara.
Rosario Ramirez Bonilla.

Campus Laguna
Ana Celeste Hernández Villegas.
Jaime Díaz Sáenz.
Perlita Jocelyn Pérez Lee.
Pedro Antonio Martínez Acosta.

Campus León
Edgar Guzmán Moreno.
Francisco Javier Valderrey Villar

Campus Cuernavaca
Sergio Francisco Hernández Alamilla.
Iyali María Curiel Enríquez.
María Magdalena de Lourdes Buenfil Mata.
Gwendolyne Delgado García de la Cadena.
Lauro Ernesto Juárez Rodríguez.
Adriana Burgos Campos.
Rafael Batres Prieto.
Rocío Cerecero López.
Ramona Fuentes Valdez.
Jaime Guillermo Arau Ruíz.
Oscar Santoyo Serna.
Camilo René Duque Becerra.
Roxana Lastiri Rangel.
Elizabeth Mena Avilés.
Zara Alexandra González Aguirre.
Karen Mayela Zárate Galván.

Campus Monterrey
Cristina Córdova Cantú.
José Luis Preciado Arreola.
Colette Marie Therese Pawlonka.

Campus Morelia
Miguel Angel García Ruiz.
Lilia Patricia López Vázquez.

Campus Obregón
Martha Concepción Gómez Abril.
María Eugenia Ballesteros Félix.

Campus Puebla
Gabriela Guadalupe Reyes Zárate.
Georgina Maldonado Carrillo.
Juan Pablo Treviño Gutiérrez.
María Alejandra Peña Romero.
Jorge Andrade Román.
Rodrigo Esparza Parga.

Campus Querétaro
Eduardo Sadot Herrera Sosa.
Pablo Gómez Pérez.
Lorena Zuñiga Garcia.
Alejandra Lorena San Martin Azócar.
Oscar Olvera Silva.
Josué Pablo Morales.
Paola Isabel Angulo Bejarano.

Campus Estado de México
Miguel Angel Rendón Valdés.
Mónica Pinal García.
Raquel Durán Valenzuela.
Elizabeth Griselda Toriz Garcia.
Roberto Martínez Román.
Arturo Alberto Hernández Medina.
Gabriel Alfonso Menchero Villegas.
Luis Enrique Herrera del Canto.
Lillian Llamas Acosta.
Alejandra Alanís Uribe.
Ezequiel Chávez Alcaraz.
Elena Gabriela Cabral Velázquez.
Esmeralda Uribe Lam.
José Gerardo Montejano Gaitán.
Ma. Anaberta Cardador Martínez.
José Manríquez Yépez.
Jhaneffer Ortega Alcántara.

Campus Saltillo
Anabel de la Cruz Lara.
Carlos Adrian Gonzalez Gómez.
Daniel Lozano Casas.
Horacio Carreón Flores.

Campus San Luis Potosí
Linda Cindy Eroza Valencia.
Hugo Marcelino Castillo Romero.

Campus Santa Fe
Alfonso Meave Avila.
Mónica Escalante De la O.

Campus Sinaloa
Alfonso Valdez Cervantes.
Lucila Menchaca Valenzuela.
Alán González Valdés.

Campus Sonora Norte
Héctor Bonillas Moreno.
Enrique Isidro Martínez Carrillo.
Norman Ramos Durazo.
Jesús Gonzalo Curiel Rosas.
Francisco Lamberto Camou Grijalva.
Rosa Vila Font.
Paloma Cristal Ariyoshi López.
José Manuel Nieto Jalil.

Campus Guadalajara
Héctor López Fernández.
Sandra Gómez Velasco.
María de la Paz Toldos Romero.
María Enriqueta Guadalupe Martínez Galindo.
Oscar Villalvazo Sánchez Sánchez.
Rocío Domínguez Villalobos.
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José Manuel Nieto Jalil.
Diana Mendoza Méndez.
Julio Cesar Avila Romero.
Juan Pablo Montes Lamas.
Fernando Antonio Palma Fierro Fierro.

Campus Toluca
María de la Cruz de Fátima Castro Ricalde.
Juan Pablo Quiroz García.
Viridiana Villavicencio Meléndrez.
Luis Gerardo González López.
José Antonio Porcayo Domínguez.
Horacio Vieyra Ruíz.
Marco Antonio López García.
Oswaldo Monroy Nava.
Ana Cecilia Franco De la Rosa.
Ignacio Tovar Fernández.
Mariel Calderón Oliver.
Carlos Dotor Cacho.
Susana Vanessa Goñi Zepeda.
Julio César Borja Medina.

Business School-EGADE

To motivate their teachers to innovate in education in times of the COVID-19 contingency, the EGADE Business School held the contest "Reinventing the digital classroom" with the participation of 37 teachers, who produced a video that made evident their creativity and use of innovative tools in the presentation of content and in the design of activities, generating a link with the practice and emotional well-being of the students.

The call launched in 2020, in coordination with CEDDIE, Educational Innovation and Technologies for Education, included different categories of participation. Below are the winning projects:



Juan José Holguín
Rapping videos
Marketing and Analysis Department
Campus Hidalgo



Georgina Maldonado Carrillo
Use of the Genially tool
Accounting and Finance Department
Campus Puebla



Luis Gerardo González
Use of the Gathertown tool
Management and Leadership
Campus Toluca

Eva María Guerra Leal
Use of the Miró tool for collaborative work
Marketing and Analysis Department
Campus Monterrey

Honorable Mention

Erika Uribe Bravo
Use of Padlet
Marketing and Analysis Deparment
Campus Santa Fe

Susana Georgina Morales García
Tutorial videos for assessment
Marketing and Analysis Department
Campus Guadalajara

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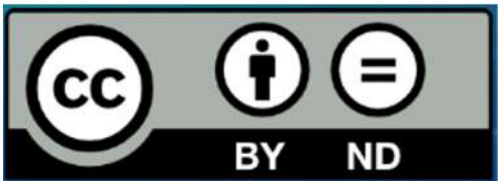
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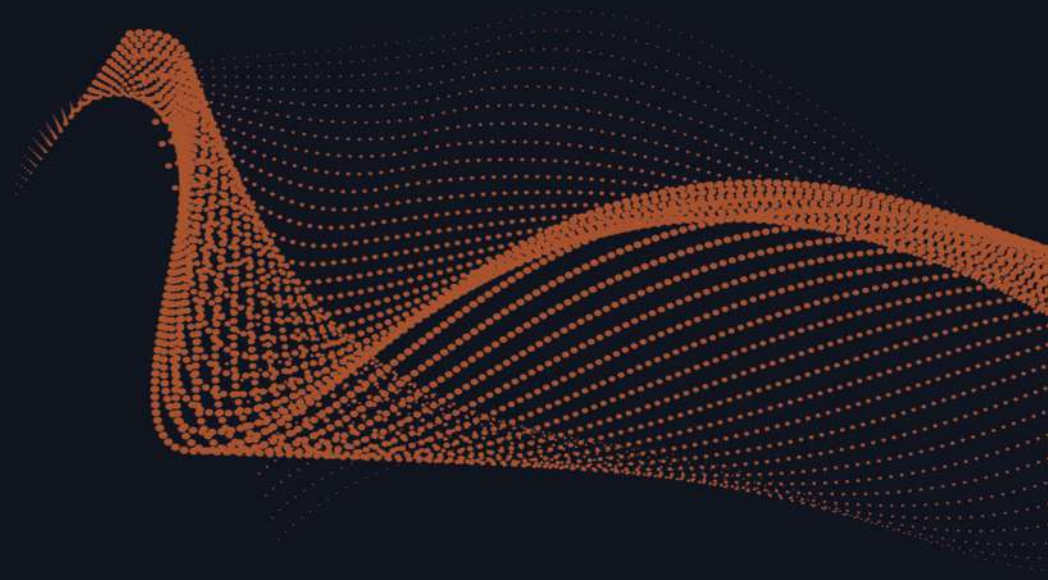
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Erika Ivonne Sepúlveda Silva
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Ana Margarita Fuster Montiel
Carla Victoria Ramírez López
Ana Gabriela Rodríguez Mendoza
Laura A. Castillo Lara
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